SOIL SURVEY

Phillips County Arkansas

Notice - Potential Update - Soils information in this manuscript is current as of the publication date. Some areas may have changed due to natural events such as flooding and erosion or because of updated mapping. The most current soils information is available on-line in the Electronic Field Office Technical Guide (e-FOTG) at the Arkansas Natural Resources Conservation Service (NRCS) website. The website is located at www.ar.nrcs.usda.gov, click on Technical Resources, Arkansas e-FOTG, County of Interest, Section II, Soils Information, County of Interest, and Soil Data Download or Soil Reports.

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
and Forest Service
In cooperation with
ARKANSAS AGRICULTURAL EXPERIMENT STATION
Issued November 1974

Major fieldwork for this soil survey was done in the period 1965–70. Soil names and descriptions were approved in 1971. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1971. This survey was made cooperatively by the Soil Consrvation Service and the Forest Service and the Arkansas Agriculaural Experiment Station. It is a part of the technical assistance furnished to the Phillips County Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Phillips County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and shows the page where each soil is described. It also gives the capability classification and woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units and woodland groups.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Town and Country Planning."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Phillips County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the general information about the county given at the beginning of the publication.

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SOIL SURVEY OF PHILLIPS COUNTY, ARKANSAS

BY JERRY L. HOGAN AND JAMES L. GRAY, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE AND FOREST SERVICE, IN COOPERATION WITH THE ARKANSAS AGRICULTURAL EXPERIMENT STATION

PHILLIPS COUNTY is in the east-central part of Arkansas (fig. 1). It is roughly triangular in shape and has an area of about 465,920 acres, or 728 square miles. It is about 27 miles wide at the northern boundary and about 10 miles wide at the southern boundary. The maximum length is about 37 miles. The northwestern corner is formed by the intersection of the fifth principal meridian and a base line. It was from this point of intersection that the Louisiana Purchase was surveyed.

The county is bounded on the east by channels of the Mississippi River, some of which are now abandoned. To the south is Desha County, to the west are the White River and Monroe County, and to the north is Lee County.

In 1970 the population of the county was 40,046. Helena, the county seat, had a population of 10,415, and West Helena had a population of 11,007. Marvell, with a population of 1,980, and Elaine, with a population of 1,210, are two other important trading centers in the county.

The economy of the county is based on farming. Except for a few manufacturing plants in and near Helena and West Helena, most of the businesses provide farm services.

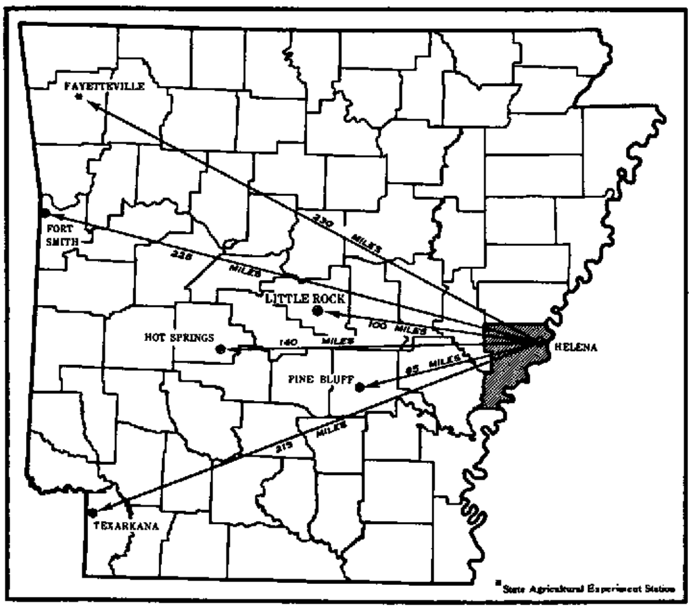

Figure 1.—Location of Phillips County in Arkansas.

General Nature of the County

This section discusses the farming, physiography and drainage, and climate in Phillips County.

Most of the soils in the county contain moderate to high amounts of plant nutrients and are among the most fertile in the State.

Uplands, where the soils formed in thick layers of windblown sediment, make up about 42 percent of the county. The uplands lie across the northern part of the county. They include the southern end of Crowley Ridge, which is the site of the cities of Helena and West Helena. The part of the St. Francis National Forest in the county also is mainly on Crowley Ridge.

Except for the steep slopes on the Ridge, most of the upland soils are suitable for cultivation or improved pasture. Excess water is a moderate to very severe limitation in the level areas, as is erosion in the more sloping areas.

About 58 percent of the county is bottom land and associated lakes and rivers. This area lies mainly south of a line that runs from Helena on the east, through Trenton, to Connells Point on the west. The soils in this area are suited to farming. Except for a few large wooded tracts, such as that within the White River National Wildlife Refuge along the southwestern side of the county and a few river islands and cutoff points, nearly all the area is cultivated. Excess water, which drains away slowly or is ponded, is a moderate to very severe limitation throughout the area. Erosion is insignificant except in a few places.

The bottom-land area is part of the combined flood plains of the White, Mississippi, and St. Francis Rivers. It was subject to frequent flooding by these rivers until levees were constructed. The last widespread flood occurred in 1937. Since then the White River levee was constructed, and major flooding has been negligible except in the areas between the rivers and their levees and along Big Creek and its tributaries. Even in the areas that are subject to such flooding, which include about 15 percent of the land area, the floods are mainly between January and June. In most years the flooded soils dry early enough that warm-season crops can be grown.

Elevation above mean sea level in the county ranges from about 380 feet atop Crowley Ridge near the county line on the north to about 140 feet near Steelman Lake in the southwestern part of the county.

Farming

Farming in Phillips County began in the better drained parts of the uplands, spread to the higher parts of the natural levees, and then gradually spread to the poorly drained flats. According to the 1969 Census of Agriculture, about 81 percent of the county, or 302,100 acres, is in farms. The rest is woodland, cities and towns, federally administered land, and transportation and utility facilities.

The early economy of the county was based on the plantation system, and cotton was the main cash crop. Farming is still the principal means of livelihood, but cropping systems have become more diversified. Since acreage allotments were placed on cotton, the importance of that crop has declined. As machinery has replaced livestock as a source of power, corn and other feed crops have also declined in importance. Soybeans and small grain have increased in importance.

Most farming in Phillips County is of a general nature. Soybeans, cotton, and wheat are the main crops, and some rice and grain sorghum are grown. Beef cattle are raised on some farms. Table 1 shows the acreage of principal crops in selected years, and table 2 gives the kinds and numbers of livestock. Over much of the county, use of improved crop varieties, improved drainage outlets, major flood control measures on the flood plains, and other improved management techniques has led to rapid expansion of farming in the wetter areas and to a great reduction in the acreage of woodland.

Farms in Phillips County, as in most of eastern Arkansas, are decreasing in number and increasing in size. Between 1964 and 1969, the number of farms decreased from 1,336 to 981 and the average size increased from 251 acres to 362 acres. Farms of 220 acres or more increased from 324 in 1964 to 346 in 1969. Farms smaller than 220 acres decreased in number. Those of less than 100 acres decreased in number the most—from 837 in 1964 to 483 in 1969. Those larger than 1,000 acres increased from 78 to 89. In 1969, 359 farm operators were full owners, 365 were part owners, and 257 were tenants. Of these operators, 419 held jobs off the farm and 255 worked off the farm for 100 days or more.

TABLE 1.—*Acreage of principal crops in stated years*

Crops	1964	1969
Soybeans (harvested for beans)	162,885	208,932
Cotton	76,093	66,923
Wheat	14,157	1,713
Other small grain (includes rice)	5,050	4,596
Corn (for all purposes)	4,202	1,636
Hay (excludes acreage on levees)	2,171	1,916
Pasture (excludes acreage on levees)	5,841	8,337

TABLE 2.—*Kinds and numbers of livestock in stated years*

Livestock	1964	1969
All cattle and calves	10,032	9,163
Milk cows	436	202
Hogs and pigs	3,859	6,359
Chickens (more than 3 months old)	32,712	13,676

The number of livestock in the county has been decreasing for several years. Most beef cattle are of good grade. Milk cows generally are of poor quality and are kept mainly for home use.

Farm-related enterprises in the county include cotton gins, compresses, and warehouses; seed oil mills; grain and soybean elevators and driers served by railway, truck, and bargeline facilities; fertilizer and farm chemical factories; and farm equipment and supply companies.

Most of the farms are small enough that the family can do most of the work and use outside labor only during peak seasons. The larger farms are operated by laborers supervised by the owner, manager, or tenant. Tenants pay a fixed rent or a percentage of the crop for use of the land. Most of the land is farmed by operators who have sufficient modern equipment to farm efficiently. Most farmers apply fertilizer according to the needs of the crop, and many use chemicals for weed control.

Physiography and Drainage

The geological deposits at the surface of Phillips County are alluvium and loess. Generally, alluvium is in the southern part of the county and loess is in the northern part. These deposits are the parent materials of the soils in the county. The alluvial sediment is more than 200 feet thick over unconsolidated material. The loess is about 5 feet to more than 50 feet thick over unconsolidated old alluvium and coastal plain sediments. Bedrock probably is at a depth of many hundreds of feet throughout the county.

The alluvium is a mixture of minerals from throughout the Mississippi River Basin. It was derived from many kinds of soil, rock, and unconsolidated sediments that came from many States.

The topography of the county can be divided into three main areas. These are the level to gently undulating bottom lands, the moderately steep to steep Crowley Ridge, and the level to moderately sloping upland plain west of Crowley Ridge.

The topography of the bottom lands ranges from broad flats to areas of alternating swales and low ridges. Except along a few streambanks, differences in elevation are minor. Slopes generally are less than 1 percent, but they are as much as 3 percent on the sides of some low ridges.

In the Crowley Ridge area, the topography is characterized by ridges that have narrow, winding tops, short side slopes, and narrow valleys between the ridges. Slopes on the ridges predominantly range from 12 to 40 percent, but along valley drainageways they generally are less than 1 percent.

West of Crowley Ridge, the upland plain is predominantly level to nearly level and slopes are less than 3 percent. Scattered low ridges and escarpments along drainageways have slopes of 3 to 12 percent.

The drainage in the county generally is southwestward through a system of natural and improved drainageways and connecting artificial channels. A small area in the northeastern corner drains southeastward. The county is well supplied with drainageways and lakes. The major natural drainageways are the Mississippi, St. Francis, and White Rivers; Porter, Beaver, Johnson, Long Lake, Cypress, Yellow Bank, Gauzley, and Little Bee Bayous; and Big, Lick, and Little Cypress Creeks.

Big Creek, Lick Creek, and Little Cypress Creek drain the northern part of the county. Long Lake, Beaver, and Johnson Bayous drain the central part of the county and empty by way of Big Creek into the White River. Porter Bayou and the St. Francis River drain the northeastern part of the county and empty into the Mississippi River. Cypress, Yellow Bank, Gauzley, and Little Bee Bayous drain the southern part of the county. Their waters are pumped, or pass through levee floodgates, into the White River. Thus, most of the county drains into the White River, but the northeastern corner and a narrow strip between the Mississippi River and its levee drain into the Mississippi River.

The many streams, as well as lakes such as Storm Creek, Porter, Old Town, Old River, and others, furnish abundant surface water for recreation, farming, and industry. The supply of ground water is also abundant. Wells 10 inches in diameter, drilled to a depth of about 120 feet, furnish an unfailing flow of water of good to fair quality at a rate of about 1,500 to 1,800 gallons per minute.

Climate [1]

Phillips County lies between the White and Mississippi Rivers in east-central Arkansas. The county is nearly level except for a small area in the northeastern corner, and large hilly areas are too distant to have a noticeable effect on the climate of the county. The relatively treeless, predominantly cultivated countryside offers little hindrance to windflow, and surface windspeed may be somewhat greater than in more rugged, wooded terrain. Table 3 gives a summary of temperature and precipitation data recorded at Helena, which are representative for the county.

The climate of Phillips County, like all of Arkansas, is one of generally warm summers and mild winters. Although there are periods of arctic weather, these cold fronts generally are of short duration, and winters are relatively free of severe cold and snow. Outdoor work can be done during much of the winter.

The most abrupt and violent weather changes are in spring. Strong frontal passages are often accompanied by turbulent weather and high-intensity rains.

Summers are long, warm, and highly humid because of the moisture brought in from the Gulf of Mexico. Evaporation from the streams, lakes, and marshes, and flooded ricefields contributes to the high humidity. Annual average relative humidity is about 70 percent. Uncomfortably high temperatures and humidity are likely from mid-May to mid-September.

In fall, days are warm and nights are cool. This is the driest and least humid season and is commonly the most pleasant. Prewinter cold fronts and sharp drops in temperature occur late in October and in November, but these generally are not accompanied by significant turbulence as are the front passages in spring. Dry airmasses are most likely in fall, when the day-to-night temperature range is the greatest.

The county has a wide range of temperature extremes.

[1] ROBERT O. REINHOLD, climatologist for Arkansas, National Weather Service, U.S. Department of Commerce, prepared this subsection.

TABLE 3.—*Temperature and precipitation*

[Data from Helena, Arkansas; period of record, 1941–70]

Month	Temperature				Precipitation		
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—	
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—
	°F.	°F.	°F.	°F.	Inches	Inches	Inches
January	51.0	32.2	76	6	4.72	1.60	9.22
February	54.9	34.9	77	13	4.84	2.21	7.62
March	62.5	41.4	83	20	5.43	2.70	8.26
April	74.0	52.3	88	32	5.30	2.86	8.34
May	81.9	60.3	94	42	4.18	1.21	8.20
June	89.1	67.9	99	53	3.23	.44	6.43
July	91.7	70.7	100	56	3.73	.91	5.61
August	90.9	69.2	102	56	3.07	.56	6.12
September	85.2	62.4	98	45	3.27	1.16	6.23
October	76.3	50.9	90	31	2.91	.69	5.71
November	63.2	40.7	81	20	4.09	1.86	7.59
December	53.2	34.1	76	13	4.82	2.05	7.61
Year	72.8	51.4			49.59		

Average temperatures in winter are normally above freezing, but nighttime temperatures are occasionally in the teens, and temperatures below 0° F. have been recorded. Normally, 65 days or more have a temperature of 90° or higher, most in July and August. The temperature can be expected to reach 100° or higher for about 6 days in most years. Minimum summer temperatures generally range from 65° to 75°. Only a few cold fronts reach the area in summer, and rarely do they bring dry airmasses into the county.

The precipitation, which averages nearly 50 inches a year, generally is adequate for most crops. It is fairly evenly distributed throughout the year. March and April are the wettest months, and they normally have nearly 11 inches of precipitation. August through October are the driest months, but about 3 inches of rainfall can be expected each month in a normal year. Warm frontal systems, or those associated with a wintery low pressure system approaching from the southern plains or the Gulf of Mexico, are the most reliable sources of moisture. A single storm can bring 2 to 5 inches or more of rainfall. Snowfall averages only about 2 to 4 inches per year and is a negligible source of moisture. Normally, snow melts within a few hours, and it frequently melts as it falls. Sleet and freezing rain are infrequent. They can seriously damage evergreen trees and shrubs and disrupt transportation and utility services, but otherwise they are of little significance.

Convective clouds form almost daily in summer, but rain received from these is erratic and poorly distributed and droughts are frequent. In some years droughts that are severe enough to injure seedlings and shallow-rooted crops occur in spring and early in summer. In most years at least one drought, lasting 15 days or more, occurs in the period of June through September. Such droughts cause severe crop damage or crop failure on such soils as the Crevasse soils.

During the hottest part of the summer, evaporation of soil moisture can average about one-third inch per day, and extended periods of high temperatures and maximum sunshine can deplete a large amount of soil moisture. A 1-inch summer rain can be dissipated in 2 or 3 days. In winter and spring, low evaporation and transpiration rates and high rainfall cause wetness and local flooding. In low-lying areas crop planting can be delayed up to several weeks during a wet period. The normally drier weather late in summer and in fall is favorable for harvesting but may reduce the growth of pasture plants and cause difficulty in establishing a stand of fall-seeded crops.

Occasionally, late frost damages crops planted early, and they may have to be replanted. Rarely do frosts come early enough in fall to damage the quality or reduce the production of crops.

The growing season is long. Normally, the 7-month period from April through October is free from vegetation-damaging low temperatures. Sunshine averages slightly more than 70 percent of the possible amount. The average date of the last freezing temperature in spring is March 24, and the first in fall is November 6. The latest date that a temperature of 32° has been recorded is April 22, and the earliest is October 16. The probability of a temperature of 32° occurring between the end of March and the first week of November is only 25 percent. The average date of the last 28° temperature in spring is March 5, and that of the first in fall is November 16. The latest date that a temperature of 28° has been recorded is April 4, and the earliest is October 23.

The prevailing wind is from the south and has an average velocity of about 9 miles per hour. Although thunderstorms are common, particularly in summer, servere thunderstorms and tornadoes are far less common. Thunderstorms with damaging winds and hail may occur three or four times in a 10-year period. Tornadoes occur only one or two times in a 10-year period, which is far below the frequency in the tornado-alley areas to the west.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Phillips County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey (*11*).[2]

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Memphis and Marvell, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Memphis silt loam, 3 to 8 percent slopes, eroded, is one of several phases within the Memphis series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

[2] Italic numbers in parentheses refer to Literature Cited, p. 76.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. One such kind of mapping unit, the undifferentiated group, is shown on the soil map of Phillips County.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the name or names of the dominant soil or soils. Alligator soils, frequently flooded, is an example. Where there are two or more dominant soils, the names are joined by "and."

One mapping unit, Fluvaquents, frequently flooded, is made up of soils unlike any known series. The unit is named in this survey using nomenclature from a higher level of the soil classification system. The known acreage of the component soils is too small to adequately define the soils as soil series. As work progresses and enough information is gathered, the soils will be defined and named.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

The soil scientists set up trial groups of soils on the basis of yield and practice tables and other data they have collected. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. Then they adjust the groups according to the results of their studies and consultations. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map in the back of this publication shows, in color, the soil associations in Phillips County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare the different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, texture, drainage, and other characteristics that affect management.

Soil associations and delineations on the general soil map in the survey area do not fully agree with those of the general soil maps for adjacent counties, published at a different date. Differences in the maps are the result of improvement in classification of soils, and because soils of major extent in one survey area may be of a minor extent in an adjacent area.

The 10 associations in Phillips County are described in this section. More detailed information about individual soils in each association can be obtained by studying the detailed map and by reading the section "Descriptions of the Soils."

The associations in Phillips County have been grouped into 3 general kinds of landscape for general interpretative purposes. These landscapes and their soil associations are described in the following pages.

Soils Formed in Wind-Laid Sediments on Uplands Characterized by Wide Flats and Low Ridges

The soils in this group make up about 30 percent of the county. They occupy most of the Southern Mississippi Valley Silty Uplands west of Crowley Ridge. They are well-drained to poorly drained and loamy. These soils formed in wind-sorted materials blown from ancient flood plains and laid down in thick deposits over older loamy and clayey alluvial sediments.

The soils in this group are used extensively for cultivated crops, and most of the orchards and pecan groves in the county are in areas of these soils. In wooded areas the vegetation is mainly cut-over hardwoods.

1. Henry-Calloway-Loring association

Poorly drained to moderately well drained, level to gently sloping, loamy soils

This association is in the northern part of the county. It consists of broad flats broken by low ridges that rise 1 to 10 feet higher than the flats. Natural drainageways are mainly slow-flowing, intermittent streams. Henry soils are on the lower part of the flats, Calloway soils are on the flats and low ridges, and Loring soils are on the upper part of the ridges.

This association occupies about 22 percent of the county. Henry soils make up about 34 percent of the association, Calloway soils 25 percent, and Loring soils 17 percent. The remaining 24 percent is Bonn, Calhoun, Falaya, Foley, Grenada, Jeanerette, Lagrange, Marvell, Memphis, and Zachary soils.

Henry soils are poorly drained. The surface layer is dark grayish-brown silt loam, and the subsurface layer is gray, mottled silt loam. The upper part of the subsoil is a brittle fragipan of gray and light brownish-gray, mottled silty clay loam, and the lower part is light olive-gray, mottled silt loam. The material beneath is light brownish-gray, mottled silt loam.

Calloway soils are somewhat poorly drained. The surface layer is dark-brown silt loam. The upper part of the subsoil is yellowish-brown, mottled silt loam; the middle part is a brittle, mottled silt loam fragipan; and the lower part is dark yellowish-brown and light brownish-gray, mottled silt loam.

Loring soils are moderately well drained. The surface layer is brown silt loam. The upper part of the subsoil is dark-brown silt loam, the middle part is dark-brown silty clay loam, and the lower part is a brittle fragipan of dark-brown, mottled silt loam. The material beneath is dark-brown, mottled silt loam.

Soils in this association are suited to farming, and most of the acreage is cultivated. Most areas need surface drainage for efficient farm management. The main crops are cotton and soybeans, but rice and winter small grain also are grown.

Farms range from about 80 to 600 acres in size. About half of the farms are operated by owners. The rest are operated by renters.

Because of wetness, a seasonal high water table, and low bearing capacity, most areas of these soils are poorly suited to residences, other buildings, and highways, but Loring soils on ridges are fairly well suited to these uses. Because of a slow percolation rate and a seasonal high water table, these soils are poorly suited to septic tank absorption fields.

2. *Loring-Memphis-Grenada association*

Moderately well drained and well drained, nearly level to moderately sloping, loamy soils

This association is in the northern part of the county and is intermingled with areas of association 1. It consists of ridgetops, of side slopes, and of escarpments along drainageways. The ridges and escarpments rise 10 to 25 feet higher than adjacent areas. Loring and Grenada soils are on the lower ridges and on the tops of higher ridges. Memphis soils are on the slopes of higher ridges and escarpments.

This association occupies about 8 percent of the county. Loring soils make up about 34 percent of the association, Memphis soils 28 percent, and Grenada soils 23 percent. The remaining 15 percent is mainly Calhoun, Calloway, Falaya, Henry, Marvell, and Zachary soils.

Loring soils are moderately well drained. The surface layer is brown silt loam. The upper part of the subsoil is dark-brown silt loam, the middle part is dark-brown silty clay loam, and the lower part is a brittle fragipan of dark-brown, mottled silt loam. The material beneath is dark-brown, mottled silt loam.

Memphis soils are well drained. The surface layer is dark yellowish-brown silt loam. The upper part of the subsoil is dark-brown silt loam, the middle part is dark-brown silty clay loam, and the lower part is dark-brown silt loam. The material beneath is dark-brown and strong-brown silt loam to sandy loam.

Grenada soils are moderately well drained. The surface layer is yellowish-brown silt loam. The upper part of the subsoil is yellowish-brown silt loam, and the lower part is a brittle, mottled fragipan of silt loam and silty clay loam. The material beneath, also a part of the fragipan, is silt loam mottled in shades of yellowish brown and light brownish gray.

Soils in this association are suited to farming, and most of the acreage is cultivated. They require careful management to help control erosion. The main crops are cotton and soybeans, but winter small grain also is grown. Some areas are better suited to pasture than to most other uses.

Farms range from about 80 to 500 acres in size. About half of the farms are operated by owners. The rest are operated by renters.

Because of the moderate bearing capacity and traffic-supporting capacity, most areas of these soils are fairly well suited to residences, other buildings, or highways. The Memphis soils are well suited to septic tank absorption fields, except where slopes are excessive, but the other soils of the association are poorly suited to septic tank absorption fields because of a slow percolation rate.

Soils Formed in Wind-Laid Sediments on Uplands Characterized by Narrow Ridges That Have Steep Sides

The soils in this group make up about 4 percent of the county. They occupy all of the Crowley Ridge part of the Southern Mississippi Valley Silty Uplands. They are well-drained and loamy. These soils formed in wind-sorted material from ancient flood plains, laid down in thick deposits over older, loamy and gravelly alluvial sediments.

The soils in this group, except those in urban areas, are used mainly for forest and for extensive recreational use. Most of the acreage is within the St. Francis National Forest.

3. *Memphis-Natchez association*

Well-drained, moderately steep to steep, loamy soils

This association is in the northeastern part of the county and includes part of Crowley Ridge. It consists of narrow, moderately steep ridges that have steep sides and of narrow, winding valleys between the ridges. Natchez soils are dominantly in the southeastern part of the association, and Memphis soils make up most of the remaining part of this area.

This association occupies about 4 percent of the county. Memphis soils make up about 51 percent of the association and Natchez soils 23 percent. The remaining 26 percent is Convent and Falaya soils.

Memphis soils are well drained. The surface layer is dark yellowish-brown silt loam. The upper part of the subsoil is dark-brown silt loam, the middle part is dark-brown silty clay loam, and the lower part is dark-brown silt loam. The underlying material is dark-brown and strong-brown silt loam to sandy loam.

Natchez soils are well drained. The surface layer is dark grayish-brown and dark-brown silt loam. The upper part of the subsoil is dark yellowish-brown silt loam, and the lower part is dark-brown silt loam. The material beneath is dark yellowish-brown silt loam.

Soils in this association are poorly suited to farming because of the slopes, and most of the acreage is woodland. Part of the St. Francis National Forest is within the association. Most of the remaining acreage is urban and built-up areas.

Because of the slopes, most areas of these soils are poorly suited to highways, residences, other buildings, or septic tank absorption fields. A considerable amount of grading is necessary to prepare building sites. The soils are highly erodible and difficult to stabilize.

Soils Formed in Alluvial Sediments on Flood Plains, Natural Levees, and Slack-Water Areas Characterized by Broad Flats and Low Terraces

The soils in this group make up about 66 percent of the county. They occupy the flood plain of Big Creek in the Southern Mississippi Valley Silty Uplands and all of the Southern Mississippi Valley Alluvium. These sandy, loamy, and clayey soils formed in sediments of the Mississippi River and its local tributaries.

The soils in this group are used extensively for cultivated crops. Except for the hardwood forests on a few river islands and in the White River National Wildlife Refuge, few large wooded tracts remain.

4. Mhoon-Zachary association

Poorly drained, level, loamy soils

This association is in the north-central part of the county. It consists of level flood plains along Big Creek. Mhoon soils are mainly on the flood plain of Big Creek, and Zachary soils are mainly on flood plains of the smaller drainageways flowing into Big Creek.

This association occupies about 2 percent of the county. Mhoon soils make up about 40 percent of the association and Zachary soils 30 percent. The remaining 30 percent is Arkabutla, Falaya, and Henry soils.

Mhoon soils are poorly drained. The surface layer is dark grayish-brown silt loam. The upper part of the subsoil is gray, mottled silt loam; the middle part is grayish-brown, mottled silty clay loam; and the lower part is gray, mottled silt loam. The material beneath is gray and light brownish-gray, mottled, stratified silty clay loam and silt loam.

Zachary soils are poorly drained. The surface layer is dark grayish-brown silt loam. The subsurface layer is light brownish-gray, mottled silt loam. The subsoil is light olive-gray, mottled silty clay loam. The material beneath is light olive-gray, mottled silt loam.

Soils in this association are poorly suited to farming because of frequent flooding. Floods generally occur between January and June. About one-third of the association is cultivated. The main crop is soybeans. Most of the remaining acreage is wooded.

Farms range from 80 to 500 acres in size. About half of the farms are operated by owners. The rest are operated by renters.

Because of frequent flooding and a seasonal high water table, these soils have severe limitations for residences, other buildings, highways, or septic tank absorption fields.

5. Foley-Amagon-Dundee association

Poorly drained and somewhat poorly drained, level, loamy soils

This association is in the central part of the county. It consists of broad flats broken by low ridges that rise 1 to 2 feet higher than the flats. Natural drainageways consist of slow-flowing, intermittent streams. The soils are intermingled, but generally the Dundee soils are on the higher parts of the ridges.

This association occupies about 11 percent of the county. Foley soils make up about 69 percent of the association, Amagon soils 10 percent, and Dundee soils 10 percent. The remaining 11 percent is Alligator, Dubbs, and Sharkey soils.

Foley soils are poorly drained. The surface layer is very dark grayish-brown and light-gray silt loam mottled with yellowish brown. The subsurface layer is gray, mottled silt loam. The upper part of the subsoil is gray and grayish-brown, mottled silt loam, and the lower part is grayish-brown and gray, mottled silty clay loam.

Amagon soils are poorly drained. The surface layer is dark grayish-brown silt loam. The subsurface layer is light brownish-gray, mottled silt loam. The upper part of the subsoil is light brownish-gray, mottled silty clay loam, and the lower part is light brownish-gray, mottled silt loam.

Dundee soils are somewhat poorly drained. The surface layer is dark grayish-brown silt loam. The upper part of the subsoil is grayish-brown, mottled silty clay loam, and the lower part is grayish-brown, mottled silt loam. The material beneath is light brownish-gray and gray, mottled silt loam and silty clay loam.

Soils in this association are well suited to farming. Except for a few small, scattered patches of hardwood trees, mainly along bayous, most of the acreage is cultivated. These soils need surface drainage for efficient farm management. The main crops are soybeans, cotton, and rice, but winter small grain is also grown.

Most farms range from 200 to 600 acres in size and are highly mechanized. About half of the farms are operated by owners. The rest are operated by renters.

Because of wetness, a seasonal high water table, and moderate to low bearing capacity, most of these soils are poorly suited to residences, other buildings, or highways. Because of a slow percolation rate and a seasonal high water table, they are poorly suited to septic tank absorption fields.

6. Arkabutla association

Somewhat poorly drained, level, loamy soils

This association is in the southwestern part of the county, in the vicinity of Lambrook. It consists of broad flats. Natural drainage is through sluggish bayous and sloughs.

This association occupies about 3 percent of the county. Arkabutla soils make up about 66 percent of the association, and the remaining 34 percent is mainly Alligator, Foley, and Sharkey soils.

Arkabutla soils are somewhat poorly drained. The surface layer is dark grayish-brown and grayish-brown silty clay loam mottled with yellowish brown. The upper part of the subsoil is grayish-brown, mottled silty clay loam, and the lower part is grayish-brown, mottled silt loam. The material beneath is grayish-brown, mottled silt loam overlying brown loamy fine sand.

Soils in this association are well suited to farming. Except for a few, small, scattered patches of hardwood trees, mainly along drainageways, most of the acreage is cultivated. These soils need surface drainage for efficient farm management. The main crops are soybeans and cotton, but rice and winter small grain also are grown. Most of the farms range from 80 to 500 acres in size and are highly mechanized. About 60 percent of the farms are operated by owners. The rest are operated by renters.

Because of wetness, a seasonal high water table, and low bearing capacity, these soils are poorly suited to residences, other buildings, or highways. Because of a slow percolation rate and a seasonal high water table, they are poorly suited to septic tank absorption fields.

7. *Sharkey association*

Poorly drained, level, clayey soils

This association mainly is in the southern part of the county, and it includes part of the White River National Wildlife Refuge. A small tract is in the northeastern part of the county and includes that part of the St. Francis National Forest that lies east of Crowley Ridge. The areas are slack-water flats. Natural drainageways are sluggish bayous and sloughs.

This association occupies about 25 percent of the county. Sharkey soils make up about 70 percent of the association, and the remaining 30 percent is mainly Alligator, Newellton, and Tunica soils; Fluvaquents, frequently flooded; levees; and water areas.

Sharkey soils are poorly drained. The surface layer is very dark grayish-brown silty clay. The subsoil and underlying material are dark-gray, mottled clay.

Soils of this association are suited to farming. About 85 percent of the acreage, excluding that in the White River National Wildlife Refuge, is cultivated. The rest is chiefly scattered stands of hardwood trees. Part of the association is tracts adjacent to Big Creek, between the White River and its levee, and between the Mississippi River and its levee. These tracts are subject to frequent flooding, mainly between January and June. Surface drainage generally is not practical in these areas. The main crop in these areas is soybeans. Areas protected by levees need surface drainage for efficient management. The main crops in these areas are cotton, soybeans, and rice, but winter small grain and pasture plants also are grown.

Most farms range from 100 to 1,000 acres in size and are highly mechanized. About 40 percent of the farms are operated by owners. The rest are operated by renters.

These soils shrink and crack when they dry, and when wet they expand and the cracks seal. Because of wetness, instability, and low bearing capacity, the soils are poorly suited to residences, other buildings, or highways. Because of a slow percolation rate and a seasonal high water table, limitations are severe for septic tank filter fields. Limitations for nonfarm uses are more severe in areas subject to flooding than in areas protected by levees.

8. *Dubbs-Dundee association*

Well-drained and somewhat poorly drained, level and gently undulating, loamy soils

This association is mainly in the central part of the county, adjacent to Old Town Lake. It consists of level and gently undulating, loamy natural levees. The undulating areas are swales that alternate with low ridges. The ridges rise 2 to 5 feet above the swales. Generally, Dubbs soils are in the higher areas, and Dundee soils are in the lower areas.

This association occupies about 3 percent of the county. Dubbs soils make up about 50 percent of the association and Dundee soils 35 percent. The remaining 15 percent is mainly Amagon and Beulah soils.

Dubbs soils are well drained. The surface layer is dark-brown silt loam. The upper part of the subsoil is dark-brown silty clay loam; the middle part is dark yellowish-brown, mottled silt loam; and the lower part is yellowish-brown, mottled very fine sandy loam. The material beneath is brown, mottled fine sandy loam.

Dundee soils are somewhat poorly drained. The surface layer is dark grayish-brown silt loam. The upper part of the subsoil is grayish-brown, mottled silty clay loam, and the lower part is grayish-brown, mottled silt loam. The material beneath is light brownish-gray and gray, mottled silt loam and silty clay loam.

This association is one of the major cotton-growing areas. Except for a few patches of hardwood trees along drainageways, nearly all of the acreage is cultivated. The Dundee soils need surface drainage for efficient farm management. The main crops are cotton and soybeans, but grain sorghum, winter small grain, and pasture plants are also grown. Truck crops are also suited.

Most farms range from 60 to 500 acres in size. About 70 percent of the farms are operated by owners. The rest are operated by renters.

Dubbs soils have slight to moderate limitations for residences, other buildings, or highways, and Dundee soils have moderate to severe limitations. Dundee soils have severe limitations for septic tank absorption fields because of a seasonal high water table and a slow percolation rate.

9. *Newellton-Sharkey-Tunica association*

Somewhat poorly drained and poorly drained, level and gently undulating, clayey soils

This association is mainly along the eastern side of the county. It consists of slack-water flats broken by gently undulating areas of alternating swales and low ridges that rise 2 to 5 feet above the flats. The soils are intermingled, but generally the Newellton and Tunica soils are in the undulating areas.

This association occupies about 10 percent of the county. Newellton soils make up about 30 percent of the association, Sharkey soils about 25 percent, and Tunica soils about 20 percent. The remaining 25 percent is mainly Commerce soils; Fluvaquents, frequently flooded; levees; and water areas.

Newellton soils are somewhat poorly drained. The surface layer is dark grayish-brown silty clay, and the subsoil is dark-gray, mottled silty clay. The material beneath is dark grayish-brown and grayish-brown, mottled, stratified silt loam to loamy fine sand.

Sharkey soils are poorly drained. The surface layer is very dark grayish-brown silty clay, and the subsoil and underlying material are dark-gray, mottled clay.

Tunica soils are poorly drained. The surface layer is dark grayish-brown silty clay, and the subsoil is dark-gray, mottled silty clay. The material beneath is dark-brown and light brownish-gray, mottled fine sandy loam and loam that is underlain by pale-brown, mottled sand.

Soils in this association are suited to farming. About 80 percent of the acreage is cultivated, and the rest is chiefly scattered patches of hardwood trees. Part of the association is between the Mississippi River and its levee, and between the White River and its levee. These tracts are subject to frequent flooding, mainly between January and June. Surface drainage generally is not practical in these areas. The main crop grown between the levee and the Mississippi River is soybeans. That part of the association between the levee and the White River is mainly included in the White River National Wildlife Refuge and is in hardwood trees. Areas protected by the levees need surface drainage for efficient farm management. The main crops in these areas are cotton and soybeans, but rice and winter small grain are also grown.

Most farms range from 160 to 600 acres in size and are highly mechanized. About 40 percent of the farms are operated by owners. The rest are operated by renters.

These soils shrink and crack when they dry, and when wet they expand and the cracks seal. Because of wetness, instability, and low bearing capacity, the soils are poorly suited to residences, other buildings, or highways. Because of a slow percolation rate and a seasonal high water table, limitations are severe for septic tank absorption fields.

10. Commerce-Robinsonville-Crevasse association

Somewhat poorly drained, well-drained, and excessively drained, level and gently undulating, loamy and sandy soils

This association is in strips that generally are adjacent and parallel to the Mississippi River. It includes the larger areas of recent, loamy and sandy natural levees deposited by the river. Most areas are level, but some are gently undulating. Generally, Commerce soils are in the lower areas, Robinsonville soils are at intermediate elevations, and Crevasse soils are in the higher areas and near the river.

This association occupies about 12 percent of the county. Commerce soils make up about 22 percent of the association, Robinsonville soils 13 percent, and Crevasse soils 8 percent. The remaining 57 percent is Convent, Jeanerette, Newellton, and Sharkey soils; Fluvaquents, frequently flooded; levees; and water areas.

Commerce soils are somewhat poorly drained. The surface layer is dark grayish-brown silt loam. The upper part of the subsoil is dark grayish-brown silt loam; the middle part is dark grayish-brown, mottled silty clay loam; and the lower part is grayish-brown, mottled silt loam. The material beneath is dark grayish-brown, grayish-brown, and gray, mottled, stratified fine sandy loam, silt loam, and silty clay loam.

Robinsonville soils are well drained. The surface layer is dark grayish-brown fine sandy loam. The material beneath is dark-brown, stratified very fine sandy loam, loamy fine sand, fine sandy loam, and loamy very fine sand.

Crevasse soils are excessively drained. The surface layer is dark grayish-brown fine sand. Below this is stratified layers of grayish-brown and dark grayish-brown fine sand and loamy fine sand.

Soils in this association generally are well suited to farming if they are protected from flooding. Except for small, scattered patches of hardwood trees, most of the acreage is cultivated. Part of this association is between the Mississippi River and its levee and is subject to frequent flooding, mainly between January and June. The main crops grown between the levee and the Mississippi River are soybeans and grain sorghum. The main crops in areas protected by the levee are cotton and soybeans, but winter small grain and pasture are also grown and truck crops are suited.

Most farms range from 100 to 800 acres in size and are highly mechanized. About half of the farms are operated by owners. The rest are operated by renters.

In areas not protected from flooding, limitations are severe for most nonfarm uses. Robinsonville soils that are protected from flooding are well suited to residences, other buildings, and highways, but Commerce soils are poorly suited to fairly well suited to these uses. Robinsonville soils are well suited to septic tank absorption fields, but Commerce soils are poorly suited to this use because of a slow percolation rate and a seasonal high water table. Crevasse soils are subject to flooding.

Descriptions of the Soils

In this section, the soils of Phillips County are described in detail and their use and management are discussed. The procedure is to describe first the soil series and then the mapping units in the series. Thus, to get full information on any mapping unit, it is necessary to read both the description of that unit and the description of the series to which the unit belongs.

The description of the soil series includes a description of a profile that is considered to be representative for all the soils of the series. If the profile of a given mapping unit differs from this representative profile, the differences are stated in the description of the mapping unit, unless they are apparent from the name of the mapping unit. Many of the terms used in describing soil series and mapping units are defined in the Glossary, and some are defined in the section "How This Survey Was Made." Munsell notations in this publication are for moist soil.

The approximate acreage and proportionate extent of the soils are shown in table 4. At the back of this soil survey is the "Guide to Mapping Units," which lists the mapping units in the county. It also shows the capability unit and woodland group in which each mapping unit has been placed.

Alligator Series

The Alligator series consists of poorly drained, level soils in slack-water areas on bottom lands of the Mississippi River. These soils formed in thick beds of predominantly clayey sediments.

In a representative profile, the surface layer is dark grayish-brown clay about 6 inches thick. The upper 8 inches of the subsoil is dark-gray, mottled clay, and the lower part is gray, mottled clay that extends to a depth of about 44 inches. The material beneath is light olive-gray and olive-gray, mottled clay.

Alligator soils are moderate to high in natural fertility, and the content of organic matter is medium to low. Permeability is very slow, and the available water capacity is high. These soils respond well to fertilizer. Be-

TABLE 4.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Alligator clay	8,992	1.9
Alligator soils, frequently flooded	3,085	.7
Amagon silt loam	6,482	1.4
Arkabutla silty clay loam	9,219	2.0
Arkabutla soils, frequently flooded	3,111	.7
Beulah fine sandy loam, gently undulating	802	.2
Bonn silt loam	547	.1
Calhoun silt loam	6,888	1.5
Calloway silt loam, 0 to 1 percent slopes	18,041	3.9
Calloway silt loam, 1 to 3 percent slopes	8,328	1.8
Commerce silt loam	7,154	1.5
Commerce soils, frequently flooded	6,796	1.5
Convent silt loam	4,930	1.1
Crevasse soils, frequently flooded	4,455	1.0
Dubbs silt loam, gently undulating	8,510	1.8
Dundee silt loam	10,245	2.2
Falaya silt loam	5,645	1.2
Fluvaquents, frequently flooded	6,344	1.4
Foley silt loam	38,987	8.4
Grenada silt loam, 1 to 3 percent slopes	12,468	2.7
Henry silt loam	36,363	7.8
Jeanerette silt loam	9,805	2.1
Lagrange fine sandy loam	1,436	.3
Loring silt loam, 1 to 3 percent slopes	25,748	5.5
Loring silt loam, 3 to 8 percent slopes, eroded	3,849	.8
Marvell fine sandy loam	974	.2
Memphis silt loam, 1 to 3 percent slopes	7,609	1.6
Memphis silt loam, 3 to 8 percent slopes, eroded	3,120	.7
Memphis silt loam, 8 to 12 percent slopes, eroded	1,045	.2
Memphis silt loam, 12 to 40 percent slopes	9,457	2.0
Mhoon soils, frequently flooded	3,697	.8
Natchez silt loam, 20 to 40 percent slopes	4,357	.9
Newellton silty clay	6,680	1.4
Newellton silty clay, gently undulating	4,390	.9
Newellton soils, frequently flooded	17,572	3.8
Robinsonville fine sandy loam	4,370	.9
Robinsonville soils, frequently flooded	2,851	.6
Sharkey silty clay	91,889	19.7
Sharkey soils, frequently flooded	9,159	2.0
Tunica silty clay	9,431	2.0
Tunica silty clay, gently undulating	3,769	.8
Tunica soils, frequently flooded	4,540	1.0
Zachary soils, frequently flooded	8,009	1.7
Levee area	4,101	.9
Water area	20,670	4.4
Total	465,920	100.0

cause of the high content of clay in the surface layer, good tilth is difficult to maintain and seedbeds are difficult to prepare. These soils clod if plowed when wet. They shrink and crack when they dry, and when wet they expand and the cracks seal.

If these soils are drained and well managed, they are suited to most crops grown in the county. Most of the acreage is cultivated.

Representative profile of Alligator clay in a moist, cultivated area in NW¼SW¼NE¼ sec. 18, T. 4 S., R. 2 E.:

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) clay; weak, fine, granular structure; firm, plastic; common fine roots; strongly acid; abrupt, smooth boundary.

B21g—6 to 14 inches, dark-gray (10YR 4/1) clay; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, plastic; common fine roots; few pores; few, fine, black concretions; very strongly acid; gradual, wavy boundary.

B22g—14 to 44 inches, gray (10YR 6/1) clay; common, medium, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, plastic; few fine roots; few pores; few, fine, black concretions; very strongly acid; gradual, smooth boundary.

C1g—44 to 61 inches, light olive-gray (5Y 6/2) clay; common, fine, distinct, pale-olive mottles; massive; firm, plastic; few, fine, black concretions; few, fine, calcium carbonate nodules; moderately alkaline; diffuse boundary.

C2g—61 to 78 inches, olive-gray (5Y 5/2) clay; common, fine and medium, yellowish-brown (10YR 5/6) mottles; massive; firm, plastic; common, fine and medium, black concretions; common, medium, calcium carbonate nodules; moderately alkaline.

The Ap horizon is dark-gray, dark grayish-brown, or gray clay to silty clay loam. The B horizon is dark gray to gray and is mottled strong brown, yellowish brown, or dark yellowish brown. The C horizon is dark-gray to light olive-gray clay, silty clay, or silty clay loam. The A horizon is strongly acid or medium acid, the B horizon is very strongly acid or strongly acid, and the C horizon is very strongly acid to moderately alkaline.

Alligator soils are chiefly associated with Sharkey, Amagon, Dundee, and Arkabutla soils. They closely resemble Sharkey soils, but are more acid to a depth of 40 inches or more. They are more clayey throughout the profile than Amagon and Dundee soils and are more clayey in the B horizon than Arkabutla soils. They are more poorly drained than Dundee and Arkabutla soils.

Alligator clay (Ac).—This soil generally is in large areas on broad slack-water flats. Areas are as much as several hundred acres in size. Slopes are less than 1 percent. The profile of this soil is the one described as representative for the series. Included in mapping were small areas of gently undulating soils and spots of Sharkey, Amagon, Dundee, and Arkabutla soils.

This soil is suited to farming, but excess water is a severe limitation. Fieldwork is frequently delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans and cotton. Grain sorghum and rice also are suited. Winter small grain can be grown if surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw–1; woodland group 2w6)

Alligator soils, frequently flooded (Ag).—This undifferentiated group consists of soils in slack-water areas, mainly along Big Creek. Individual areas range from about 50 to 200 acres in size. Slopes are less than 1 percent. These soils have a profile similar to the one described as representative for the series, but the surface layer ranges from clay to silty clay loam. They are flooded for periods of 1 week to 4 months, generally between January and June. Floods occur about 9 years in 10. Included in mapping were small areas of undulating soils and spots of Sharkey and Arkabutla soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw–1; woodland group 3w6)

Amagon Series

The Amagon series consists of poorly drained soils on broad flats and in shallow depressions on the lower part of old natural levees. These soils formed in stratified beds of loamy sediments.

In a representative profile, the surface layer is dark grayish-brown silt loam about 5 inches thick. The subsurface layer is light brownish-gray, mottled silt loam about 7 inches thick. The upper part of the subsoil is light brownish-gray, mottled silty clay loam about 20 inches thick, and the lower part is light brownish-gray, mottled silt loam that extends to a depth of 72 inches or more.

Amagon soils are moderate in natural fertility. Organic-matter content is low. Permeability is slow, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plow pan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Amagon silt loam in a moist, cultivated area in SW¼NW¼SE¼ sec. 24, T. 3 S., R. 2 E.:

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; many fine roots; very strongly acid; clear, smooth boundary.

A2g—5 to 12 inches, light brownish-gray (2.5Y 6/2) silt loam; common, fine, distinct, brown mottles; weak, medium, subangular blocky structure; very friable; many fine roots; many pores; very strongly acid; clear, smooth boundary.

B21tg—12 to 21 inches, light brownish-gray (2.5Y 6/2) silty clay loam; many, fine, distinct, brown mottles and few, fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; firm, slightly plastic; patchy clay films on faces of peds; common pores; common fine roots; very strongly acid; clear, wavy boundary.

B22tg—21 to 32 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; firm, slightly plastic; patchy clay films on faces of some peds and in pores; common pores; very strongly acid; clear, smooth boundary.

B23tg—32 to 52 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; patchy clay films on some ped faces and in pores; common pores; very strongly acid; clear, smooth boundary.

B3—52 to 72 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles and few, medium, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; many, fine, dark concretions; medium acid.

The Ap horizon is dark grayish brown to brown. The B horizon is gray, light brownish-gray, or light-gray silt loam or silty clay loam. The C horizon begins at a depth between 48 and 84 inches in many places. Its texture and color are similar to those of the B horizon. A IIC horizon of dark-brown to yellowish-brown fine sandy loam to loamy sand that is mottled gray or grayish brown is present in places. Reaction ranges from medium acid to very strongly acid throughout the profile.

These soils have an A horizon that is slightly thinner than the defined range for the series, but this difference does not alter their usefulness and behavior.

Amagon soils are chiefly associated with Dundee, Foley, and Alligator soils. They are lighter gray in the upper part of the B horizon than Dundee soils. They are more acid in the lower part of the B horizon and have a lower content of sodium and magnesium than Foley soils. They have a B horizon of translocated clay that Alligator soils lack, and they contain less clay in the B horizon than the Alligator soils.

Amagon silt loam (Am).—This soil is on broad flats and in shallow depressions. Individual areas range from about 30 to 600 acres in size. Slope is less than 1 percent. Included in mapping were spots of Dundee, Foley, and Alligator soils.

This soil is suited to farming, but wetness is a severe limitation. Fieldwork is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans, cotton, and rice (fig 2). Grain sorghum also is suited, and winter small grain can be grown if surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw–2; woodland group 1w6)

Arkabutla Series

The Arkabutla series consists of somewhat poorly drained, level soils on the lower part of natural levees. These soils formed in stratified beds of predominantly loamy alluvium.

In a representative profile, the surface layer is silty clay loam about 12 inches thick. The upper 6 inches is dark grayish brown, and the lower part is grayish brown mottled with yellowish brown. The upper 17 inches of the subsoil is grayish-brown, mottled silty clay loam, and the lower part is grayish-brown, mottled silt loam that extends to a depth of about 57 inches. The material beneath is grayish-brown, mottled silt loam that is underlain by brown loamy fine sand.

Arkabutla soils are moderate in natural fertility. Content of organic matter is medium to low. Permeability is moderately slow, and the available water capacity is high. These soils respond well to fertilizer. In most tracts the content of clay in the surface layer makes good tilth somewhat difficult to maintain and seedbeds somewhat difficult to prepare. These soils clod if plowed when wet.

These soils are suited to most crops grown in the county. Most of the acreage is cultivated.

Representative profile of Arkabutla silty clay loam in a moist, cultivated area in SE¼SW¼NE¼ sec. 24, T. 4 S., R. 1 E.:

Ap1—0 to 6 inches, dark grayish-brown (10YR 4/2) silty clay loam; weak, fine, granular structure; firm; common fine roots; medium acid; abrupt, smooth boundary.

Ap2—6 to 12 inches, grayish-brown (10YR 5/2) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; weak, medium, subangular blocky structure; firm; common fine roots; few pores; common, medium and fine, black concretions; medium acid; abrupt, smooth boundary.

B21—12 to 29 inches, grayish-brown (10YR 5/2) silty clay loam; many, coarse, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; few fine roots; few pores; common,

Figure 2.—Rice being harvested on Amagon silt loam.

medium and fine, black concretions; strongly acid; clear, smooth boundary.

B22—29 to 46 inches, grayish-brown (10YR 5/2) silt loam; common, coarse, distinct, dark yellowish-brown (10YR 4/4) mottles and few, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; friable; few fine roots; common pores; few, medium and fine, black concretions; strongly acid; clear, smooth boundary.

B3—46 to 57 inches, grayish-brown (10YR 5/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles and few, fine, distinct, yellowish-brown mottles; weak, coarse, subangular blocky structure; friable; few fine roots; few pores; few, fine, black concretions; strongly acid; gradual, smooth boundary.

C1—57 to 67 inches, grayish-brown (10YR 5/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles and few, medium and fine, distinct, yellowish-brown (10YR 5/6) mottles; massive; friable; medium acid; abrupt, smooth boundary.

IIC2—67 to 82 inches, brown (10YR 5/3) loamy fine sand; massive; loose; slightly acid.

The A horizon is dark grayish-brown or grayish-brown silty clay loam or silt loam. The B horizon is silty clay loam or silt loam mottled with yellowish brown, dark yellowish brown, or brownish yellow. The C horizon is light brownish gray to grayish brown. The IIC horizon is lacking in places. The A horizon is strongly acid to slightly acid, the B horizon is very strongly acid or strongly acid, and the C horizon is very strongly acid to neutral.

Arkabutla soils are chiefly associated with Alligator and Dundee soils. They have a B horizon that contains less clay and is browner than that of the Alligator soils. They lack the B horizon of clay accumulation that the Dundee soils have.

Arkabutla silty clay loam (Ar).—This somewhat poorly drained, nearly level soil is on old natural levees. Individual areas range from about 50 to 1,000 acres in size. Slope is less than 1 percent. The profile of this soil is the one described as representative for the series. Included in mapping were small areas of gently undulating soils and spots of Alligator and Dundee soils.

This soil is well suited to farming, but wetness is a moderate hazard. Fieldwork is commonly delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are cotton and soybeans. Corn, grain sorghum, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-1; woodland group 1w5)

Arkabutla soils, frequently flooded (As).—This undifferentiated group consists of nearly level soils on old natural levees along Big Creek. Individual areas range from 15 to 100 acres in size. Slope is less than 1 percent.

The profile of these soils is similar to the one described as representative for the series, but the surface layer ranges from silty clay loam to silt loam. These soils are flooded for periods of about 1 week to 4 months, generally between January and June. Floods occur about 9 years in 10. Included in mapping were small areas of undulating soils and spots of Alligator soils.

These soils are suited to farming, but flooding is a severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw-2; woodland group 1w6)

Beulah Series

The Beulah series consists of somewhat excessively drained, gently undulating soils on the higher parts of the older natural levees bordering bayous and abandoned stream channels. These soils formed in stratified loamy and sandy sediments.

In a representative profile, the surface layer is dark-brown fine sandy loam about 8 inches thick. The upper 15 inches of the subsoil is dark yellowish-brown fine sandy loam, and the lower part is yellowish-brown fine sandy loam that extends to a depth of about 28 inches. Below this is brown fine sandy loam about 8 inches thick over brown and pale-brown loamy fine sand and loamy sand.

Beulah soils are moderate in natural fertility. Content of organic matter is medium to low. Permeability is moderately rapid, and the available water capacity is moderate to low. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed below the plow layer. This pan restricts penetration of roots and movement of water through the soil. These soils warm early in spring and can be planted early.

These soils are suited to the crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Beulah fine sandy loam, gently undulating, in a moist, cultivated area in SE¼NE¼SE¼ sec. 29, T. 3 S., R. 3 E.:

Ap1—0 to 4 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; friable; many fine roots; medium acid; abrupt, smooth boundary.

Ap2—4 to 8 inches, dark-brown (10YR 4/3) fine sandy loam; weak, coarse, subangular blocky structure; friable; many fine roots; few pores; medium acid; abrupt, smooth boundary. .

B2—8 to 23 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, medium, subangular blocky structure; friable; common fine roots; few pores; very strongly acid; clear, smooth boundary.

B3—23 to 28 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, coarse, subangular blocky structure; friable; few fine roots; strongly acid; clear, smooth boundary.

IIC2—36 to 48 inches, brown (10YR 5/3) loamy fine sand; massive; friable; few fine roots; strongly acid; clear, smooth boundary.

IIC-2—36 to 48 inches, brown (10YR 5/3) loamy fine sand; single grain, loose; few fine roots; medium acid; clear, smooth boundary.

IIC3—48 to 61 inches, brown (10YR 5/3) loamy sand; single grain, loose; few bedding planes; slightly acid; clear, smooth boundary.

IIC4—61 to 72 inches, pale-brown (10YR 6/3) loamy sand; single grain, loose; few bedding planes; slightly acid.

The Ap horizon is dark grayish brown, dark brown, grayish brown, or brown. The B horizon is dark yellowish brown, yellowish brown, or brown. The C horizon is dark yellowish brown, yellowish brown, or brown. The IIC horizon is brown, pale-brown, or grayish-brown loamy fine sand to sand. The A horizon is medium acid or strongly acid, the B horizon is very strongly acid or strongly acid, the C horizon is medium acid or strongly acid, and the IIC horizon is medium acid to mildly alkaline.

Beulah soils are chiefly associated with Dubbs and Dundee soils. They are more rapidly permeable than the Dubbs and Dundee soils, and they lack the accumulation of clay in the B horizon that those soils have. The are not so gray as the Dundee soils, and they lack the mottling that those soils have.

Beulah fine sandy loam, gently undulating (BeU).—This soil is in areas where short slopes alternate with narrow depressions. Individual areas generally range from 10 to 80 acres in size. Slope ranges from 0 to 3 percent. Included in the mapping are spots of Dubbs and Dundee soils.

This soil is well suited to farming. Because of the limited available water capacity, droughtiness is a moderate limitation. If the soil is bare in spring, soil blowing is a moderate hazard. Clean-tilled crops that leave a large amount of residue can be grown safely year after year if good management is used.

The main crop is cotton. Peanuts, grain sorghum, soybeans, winter small grain, and such truck crops as okra, green beans, potatoes, sweet corn, tomatoes, and melons also are suited. Suitable pasture plants are bermudagrass, annual lespedeza, and white clover. (Capability unit IIs-1; woodland group 2o4)

Bonn Series

The Bonn series consists of poorly drained, level soils on upland flats. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is silt loam about 7 inches thick. The upper 2 inches is dark gray, and the lower 5 inches is light brownish gray and mottled with dark yellowish brown. The upper 16 inches of the subsoil is gray and grayish-brown, mottled silt loam; the middle part is light olive-gray, mottled silty clay loam about 12 inches thick; and the lower part is gray, mottled silt loam that extends to a depth of about 51 inches. The material beneath is gray, mottled silt loam.

Bonn soils are low in natural fertility. Content of organic matter is low. Permeability is very slow, and the available water capacity is low.

These soils are poorly suited to cultivated crops, because sodium and magnesium are at a level toxic to most plants. These soils are better suited to pasture and wildlife habitat than to most other uses.

Representative profile of Bonn silt loam in a moist, idle area in NW¼NW¼NW¼ sec. 14, T. 2 S., R. 1 E.:

Ap1—0 to 2 inches, dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; friable; many fine roots; few, fine, black concretions; very strongly acid; abrupt, smooth boundary.

Ap2—2 to 27 inches, light brownish-gray (10YR 6/2) silt loam; common, medium and fine, dark yellowish-brown (10YR 4/4) mottles; weak, coarse, subangular blocky structure; friable; many fine roots; few pores; few, fine, black concretions; medium acid; abrupt, smooth boundary.

Btg&A2—7 to 17 inches, gray (10YR 6/1) silt loam; many fine, distinct, dark yellowish-brown mottles and few, fine, distinct, yellowish-brown mottles; weak, coarse, prismatic structure parting to moderate, coarse, subangular blocky; friable; continuous clay films on faces of peds; common fine and few large roots; few pores; few light-gray (10YR 7/1) silt tongues ½ to 2 inches in diameter extend through the horizon; few root holes lined with bark of decayed root and filled with light-gray (10YR 7/1) silt; common, fine, black concretions; neutral; gradual, smooth boundary.

B22tg—17 to 23 inches, grayish-brown (2.5Y 5/2) silt loam; common, fine and medium, dark yellowish-brown (10YR 4/4) mottles; weak, coarse, prismatic structure; firm; clay films on faces of peds and in some pores; few fine roots; few pores; few tongues of light-gray (10YR 7/1) silt in vertical seams between peds; common, fine, black concretions; moderately alkaline; gradual, wavy boundary.

B23tg—23 to 35 inches, light olive-gray (5Y 6/2) silty clay loam; common, medium and fine, yellowish-brown (10YR 5/6) and dark yellowish-brown (10YR 4/4) mottles; weak, coarse, prismatic structure; firm; clay films on faces of peds and in some pores; few fine roots; few pores; few fine root channels with black (10YR 2/1) coatings; few, fine, black concretions; moderately alkaline; clear, wavy boundary.

B24tg—35 to 51 inches, gray (10YR 6/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure; firm; patchy clay films on faces of peds; few pores; common, fine, black concretions; moderately alkaline; diffuse boundary.

C1g—51 to 69 inches, gray (10YR 6/1) silt loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; friable; common, fine and medium, calcium carbonate nodules; common, fine, black concretions; very strongly alkaline; diffuse boundary.

C2g—69 to 81 inches, gray (10YR 6/1) silt loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; friable; common, fine and medium, calcium carbonate nodules; common, fine, black concretions; strongly alkaline.

The Ap horizon is dark gray to light brownish gray. The B horizon is light olive-gray, gray, light brownish-gray, or grayish-brown silt loam or silty clay loam mottled with brown to dark yellowish brown. The C horizon has colors similar to those of the B horizon. The A horizon is very strongly acid to neutral, the B horizon is neutral to moderately alkaline, and the C horizon is moderately alkaline to very strongly alkaline.

Bonn soils are chiefly associated with the Foley and Calhoun soils. They have a high content of sodium and magnesium nearer to the surface than Foley soils. They are higher in sodium and magnesium throughout the B and C horizons than the Calhoun soils.

Bonn silt loam (Bo).—This soil is on broad upland flats. Individual areas range from about 5 to 40 acres in size. Slope is less than 1 percent. Included in mapping were spots of Foley and Calhoun soils.

This soil is better suited to pasture and wildlife habitat than to most other uses. It is poorly suited to farming because of droughtiness and the high concentration of sodium and magnesium throughout the subsoil. Plants grown on this soil are stunted and commonly die before they mature.

Where this soil is cultivated, mainly as part of fields of other soils, the main crops are soybeans and grain sorghum. If surface drainage is adequate, shallow-rooted, cool-season plants survive better than warm-season crops. Pasture plants most likely to survive are bermudagrass and annual lespedeza. (Capability unit IVs–1; woodland group 5t0)

Calhoun Series

The Calhoun series consists of poorly drained soils in level and depressional areas on uplands. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is brown silt loam about 5 inches thick. The subsurface layer is light brownish-gray, mottled silt loam about 12 inches thick. The upper part of the subsoil is gray, mottled silty clay loam about 10 inches thick, and the lower part is light brownish-gray, mottled silt loam about 25 inches thick. Below this is light brownish-gray, mottled silt loam that extends to a depth of 80 inches or more.

Calhoun soils are moderate in natural fertility. Organic-matter content is low. Permeability is slow, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. The pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Calhoun silt loam in a moist, cultivated area in NW¼NW¼SW¼ sec. 21, T. 1 S., R. 4 E.:

Ap—0 to 5 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; common fine roots; few, fine, black concretions; slightly acid; abrupt, smooth boundary.

A2g—5 to 17 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, dark-brown (10YR 4/3) and yellowish-brown (10YR 5/4) mottles; weak, coarse, subangular blocky structure; friable; few fine roots; few, fine, black concretions; strongly acid; clear, smooth boundary.

B21tg—17 to 27 inches, gray (10YR 6/1) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; light-gray (10YR 7/2) silt coatings on faces of some peds; common tongues of light-gray (10YR 7/2) silt ½ to 3 inches in diameter extend through the horizon; patchy clay films on faces of peds; few fine roots; few pores; common, fine, black concretions; very strongly acid; gradual, wavy boundary.

B22tg—27 to 40 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; patchy clay films on faces of some peds; few fine roots; few pores; common, fine and medium, black concretions; strongly acid; gradual, wavy boundary.

B3g—40 to 52 inches, light brownish-gray (2.5Y 6/2) silt loam; common, fine, distinct, yellowish-brown mottles; weak, coarse, subangular blocky structure; firm; few pores; common, fine and medium, black concretions; strongly acid; gradual, wavy boundary.

C1g—52 to 67 inches, light brownish-gray (2.5Y 6/2) silt loam; common, fine, distinct, yellowish-brown mottles; massive; friable; common, fine and medium, black concretions; medium acid; gradual, wavy boundary.

C2g—67 to 80 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; friable; common, fine and medium, black concretions; neutral.

The Ap horizon is dark grayish brown, brown, or grayish brown. The A2 horizon is light brownish gray, gray, or light gray. The B horizon is gray or light brownish-gray silty clay loam or silt loam. The A horizon is strongly acid to slightly acid, the B2 horizon is strongly acid or very strongly acid, the B3 horizon is very strongly acid to slightly acid, and the C horizon is medium acid to mildly alkaline.

Calhoun soils are chiefly associated with Calloway, Henry, Foley, and Bonn soils. They lack the fragipan that Calloway and Henry soils have. They have a grayer B horizon and lack the A2 horizon that Calloway soils have. They lack the high content of sodium in the B and C horizons that Foley and Bonn soils have.

Calhoun silt loam (Ca).—This soil is on broad upland flats. Individual areas range from about 20 to 80 acres in size. Slope is less than 1 percent. Included in mapping were spots of Calloway, Henry, Foley, and Bonn soils.

This soil is suited to farming, but wetness is a severe limitation. Fieldwork is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans and cotton. Grain sorghum and rice also are suited, and winter small grain can be grown if surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw-3; woodland group 3w9)

Calloway Series

The Calloway series consists of somewhat poorly drained, level to nearly level soils on uplands. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is dark-brown silt loam about 7 inches thick. The upper part of the subsoil is yellowish-brown, mottled silt loam about 12 inches thick. Below this is a layer of light-gray silt loam about 8 inches thick. The middle part of the subsoil is a mottled silt loam fragipan about 35 inches thick. The upper 8 inches of the fragipan is light gray; the next 6 inches is light brownish gray, and the lower 21 inches is brown. The lower part of the subsoil is dark yellowish-brown and light brownish-gray, mottled silt loam that extends to a depth of 72 inches or more.

Calloway soils are moderate in natural fertility. Organic matter content is low. Permeability is slow, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plow pan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Calloway silt loam, 0 to 1 percent slopes, in a moist, cultivated area in NW¼SW¼SE¼ sec. 35, T. 2 S., R. 1 E.:

Ap1—0 to 4 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; common fine roots; common, fine, black concretions; strongly acid; abrupt, smooth boundary.

Ap2—4 to 7 inches, dark-brown (10YR 4/3) silt loam; weak, medium and coarse, subangular blocky structure; friable; common fine roots; few, fine, black concretions; medium acid; abrupt, smooth boundary.

B2—7 to 19 inches, yellowish-brown (10YR 5/4) silt loam; many, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; common fine roots; few pores; few large root holes filled with dark-brown (10YR 4/3) silt loam; few, fine, black concretions; very strongly acid; gradual, wavy boundary.

A'2—19 to 27 inches, light-gray (10YR 7/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable, slightly brittle; few fine roots; common pores; common, fine, black concretions; strongly acid; clear, wavy boundary.

B'x1—27 to 33 inches, light brownish-gray (10YR 6/2) silt loam; many, coarse, distinct, yellowish-brown (10YR 5/4) mottles; moderate, coarse, prismatic structure parting to moderate, medium, subangular blocky; firm, compact and brittle; patchy clay films on faces of peds; some peds coated with light-gray (10YR 7/1) silt; few fine roots between peds; common pores; common, fine, black concretions; strongly acid; clear, wavy boundary.

B'x2—33 to 54 inches, brown (10YR 5/3) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles and few, medium, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, angular blocky structure; firm, compact and brittle; patchy clay films on faces of peds and some pores lined with clay; few fine roots between peds; common pores; few fine, black concretions; strongly acid; clear, smooth boundary.

B3—54 to 72 inches, mottled dark yellowish-brown (10YR 4/4) and light brownish-gray (10YR 6/2) silt loam; weak, coarse, subangular blocky structure; friable; some peds coated with black (10YR 2/1); few, fine, black concretions; neutral.

The Ap horizon is dark grayish brown to brown. The A'2 horizon is light gray or light brownish gray. The B'2 horizon is yellowish brown to grayish brown. The B'x horizon is light brownish-gray to brown silty clay loam or silt loam. The A horizon is strongly acid to slightly acid; the B2, A'2, and B'x horizons are strongly acid or very strongly acid; and the B3 horizon is strongly acid to neutral.

Calloway soils are chiefly associated with Grenada, Calhoun, and Henry soils. They have mottles in the upper 10 inches of the B horizon that Grenada soils lack. They have an A'2 horizon and a fragipan that Calhoun soils lack, and they have a browner B horizon. They are browner than Henry soils, and they have a B horizon above the fragipan and have an A'2 horizon that tongues into the B'x horizon that Henry soils lack.

Calloway silt loam, 0 to 1 percent slopes (CbA).—This somewhat poorly drained soil is on uplands. Individual areas range from 20 to 150 acres in size. The profile of this soil is the one described as representative for the series. Included in mapping were spots of Grenada, Calhoun, and Henry soils.

This soil is suited to farming, but wetness is a moderate limitation. Fieldwork is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans and cotton. Grain sorghum and rice also are suited, and winter small grain can be grown if surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-2; woodland group 3w8)

Calloway silt loam, 1 to 3 percent slopes (CbB).—This somewhat poorly drained soil is on uplands. Individual areas range from 20 to 80 acres in size. The profile of this soil is similar to the one described as representative for the series, but erosion has removed some of the original surface layer. Included in mapping were spots of Grenada, Calhoun, and Henry soils.

This soil is suited to farming, but runoff is medium and erosion is a moderate hazard on long slopes. In less sloping areas wetness is a moderate limitation. Clean-tilled crops that leave a large amount of residue can be grown year after year if contour cultivation, terraces on long slopes, surface drains in less sloping areas, and other good management practices are used.

The main crops are cotton and soybeans. Corn, grain sorghum, rice, and winter small grain also are suited. Okra is a suitable truck crop. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIe-2; woodland group 3w8)

Commerce Series

The Commerce series consists of somewhat poorly drained, level to gently undulating soils on the lower part of young natural levees. These soils formed in stratified beds of loamy sediments.

In a representative profile, the surface layer is dark grayish-brown silt loam about 5 inches thick. The upper part of the subsoil is dark grayish-brown silt loam about 8 inches thick, the middle part is dark grayish brown, mottled silty clay loam about 5 inches thick, and the lower part is grayish-brown, mottled silt loam that extends to a depth of about 22 inches. The underlying material is dark grayish-brown, grayish-brown, and gray, mottled, stratified fine sandy loam, silt loam, and silty clay loam.

Commerce soils are high in natural fertility. Content of organic matter is medium to low. Permeability is moderately slow, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soils.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Commerce silt loam in a moist, cultivated area in SE¼NE¼NW¼ sec. 24, T. 6 S., R. 1 E.:

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; mildly alkaline; abrupt, smooth boundary.

B1—5 to 13 inches, dark grayish-brown (10YR 4/2) silt loam; weak, coarse, subangular blocky structure; friable; common fine roots; few pores; mildly alkaline; clear, smooth boundary.

B2—13 to 18 inches, dark grayish-brown (10YR 4/2) silty clay loam; few, fine, faint, yellowish-brown mottles; moderate, medium, subangular blocky structure; firm; common fine roots; common pores; mildly alkaline-clear, smooth boundary.

B3—18 to 22 inches, grayish-brown (10YR 5/2) silt loam; common, medium and fine, distinct, dark-brown (10YR 4/3) mottles; weak, medium, subangular blocky structure; friable; common fine roots; common pores; few, fine, black concretions; mildly alkaline; clear, smooth boundary.

C1—22 to 31 inches, dark grayish-brown (10YR 4/2) fine sandy loam; common, fine, distinct, yellowish-brown mottles; weak, coarse, subangular blocky structure; friable; common fine roots; common pores; few, fine, black concretions; mildly alkaline; clear, smooth boundary.

C2—31 to 45 inches, grayish-brown (10YR 5/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/4) and dark yellowish-brown (10YR 4/4) mottles; weak, coarse, subangular blocky structure; friable; few fine roots; common pores; few, fine, black concretions; mildly alkaline; clear, smooth boundary.

C3g—45 to 51 inches, gray (10YR 5/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/4) and dark yellowish-brown (10YR 4/4) mottles; massive; friable; few, fine, black concretions; mildly alkaline; clear, smooth boundary.

C4g—51 to 72 inches, gray (10YR 5/1) silty clay loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; massive; firm; few, fine, black concretions; mildly alkaline.

The A horizon is grayish-brown to dark-brown fine sandy loam to silty clay loam. The B horizon is dark grayish-brown or grayish-brown silt loam or silty clay loam. The C horizon is gray to dark grayish-brown, erratically stratified layers of fine sandy loam to silty clay loam. The A horizon is slightly acid to mildly alkaline, and the B and C horizons are neutral to moderately alkaline.

Commerce soils are chiefly associated with Crevasse, Robinsonville, and Newellton soils. They are more poorly drained, grayer, and less permeable than Crevasse and Robinsonville soils. They have less clay in the B horizon than Newellton soils.

Commerce silt loam (Cm).—This soil is on the lower part of natural levees. Individual areas range from about 50 to 400 acres in size. Slope is less than 1 percent. The profile of this soil is the one described as representative for the series. Included in mapping were spots of Robinsville and Newellton soils and small areas of gently undulating soils.

This soil is well suited to farming. Excessive water on the surface early in spring may delay planting. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans and cotton. Corn, grain sorghum, alfalfa, winter small grain, and such truck crops as okra, green beans, and tomatoes also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-1; woodland group 1w5)

Commerce soils, frequently flooded (Cn).—This undifferentiated group consists of level to gently undulating soils on the lower part of natural levees. Individual areas range from about 20 to 800 acres in size. Slope is less than 3 percent. The profile of these soils is similar to the one described as representative for the series, but the surface layer ranges from fine sandy loam to silty clay loam. These soils are between the levee and the Mississippi River and are flooded for periods of 3 to 95 days, generally between January and June. Floods occur on an average of about once every 2 years. Included in mapping were spots of Crevasse, Robinsonville, and Newellton soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw-3; woodland group 1w5)

Convent Series

The Convent series consists of somewhat poorly drained, level soils on young natural levees and on alluvial fans at the foot of Crowley Ridge. These soils formed in stratified beds of loamy sediments.

In a representative profile, the surface layer is dark grayish-brown silt loam about 7 inches thick. The material beneath is stratified layers of grayish-brown, dark-gray, and gray, mottled silt loam.

Convent soils are high in natural fertility. Content of organic matter is medium to low. Permeability is moderate, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. About half of the acreage is cultivated. The rest is within built-up areas or within the St. Francis National Forest.

Representative profile of Convent silt loam in a moist, cultivated area in SE¼NW¼NE¼ sec. 10, T. 2 S., R. 4 E.:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; neutral; abrupt, smooth boundary.

C1—7 to 21 inches, grayish-brown (10YR 5/2) silt loam; many, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, coarse, platy structure; friable; common bedding planes; common fine roots; common pores; moderately alkaline; gradual, smooth boundary.

C2—21 to 41 inches, grayish-brown (10YR 5/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, coarse, platy structure; friable; common bedding planes; few fine roots; common pores; few, fine, black concretions; mildly alkaline; abrupt, smooth boundary.

C3—41 to 56 inches, grayish-brown (10YR 5/2) silt loam; common, fine, distinct, yellowish-brown mottles; weak, medium, platy structure; friable; many bedding planes; mildly alkaline; abrupt, smooth boundary.

C4g—56 to 65 inches, dark-gray (10YR 4/1) silt loam; many, fine, prominent, yellowish-red mottles; weak, coarse, platy structure; friable; common bedding planes; common pores; neutral; abrupt, smooth boundary.

C5g—65 to 73 inches, gray (10YR 5/1) silt loam; many, fine, prominent, yellowish-red mottles; weak, coarse, platy structure; friable, few bedding planes; common pores; few, fine, black concretions; neutral.

The A horizon is dark grayish brown to brown. The upper part of the C horizon is dark grayish-brown or grayish-brown, thinly stratified silt loam to fine sandy loam. The Cg horizon is light brownish gray to dark gray. Reaction ranges from neutral to moderately alkaline throughout the profile.

Convent soils are chiefly associated with Falaya and Jeanerette soils. They are neutral to moderately alkaline in reaction throughout the profile, whereas the Falaya soils have a thick A horizon that is strongly acid or very strongly acid. They contain less clay, have a lighter-colored A horizon, and are better drained than the Jeanerette soils.

Convent silt loam (Co).—This soil is on young natural levees and on alluvial fans at the foot of Crowley Ridge. Individual areas range from about 50 to 200 acres in size. Slope is less than 1 percent. Included in mapping were small spots of Falaya and Jeanerette soils.

This soil is well suited to farming. Water on the surface early in spring may delay planting. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans and cotton. Corn, grain sorghum, alfalfa, winter small grain, and such truck crops as okra, green beans, and tomatoes also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-1; woodland group 1w5)

Crevasse Series

The Crevasse series consists of excessively drained, level to gently undulating soils at the highest elevations on natural levees. These soils formed in sandy sediments.

In a representative profile, the surface layer is dark grayish-brown fine sand about 8 inches thick. Beneath are stratified layers of grayish-brown and dark grayish-brown fine sand and loamy fine sand.

Crevasse soils are low in natural fertility, and the content of organic matter is low. Permeability is rapid. The available water capacity is low. These soils respond moderately well to fertilizer, and good tilth is easy to maintain. They warm early in spring and can be planted early, but they are droughty and subject to flooding.

These soils are poorly suited to farming, and only about half of the acreage is cultivated.

Representative profile of a Crevasse fine sand in a moist, cultivated area of Crevasse soils, frequently flooded, on Island No. 64 (survey incomplete; approximate location, by extension of existing section lines, is NW¼NE¼NW¼ sec. 25, T. 5 S., R. 2 E.):

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) fine sand; single grain; loose; many fine roots; slightly acid; abrupt, smooth boundary.

C1—8 to 17 inches, grayish-brown (10YR 5/2) fine sand; single grain; loose; common fine roots; common lenses of dark grayish-brown (10YR 4/2) loamy fine sand about ⅛ inch thick; mildly alkaline; abrupt, smooth boundary.

C2—17 to 51 inches, grayish-brown (10YR 5/2) fine sand; single grain to weak, platy structure; loose; few fine roots; many lenses of dark grayish-brown (10YR 4/2) loamy fine sand about ⅛ inch thick; mildly alkaline; clear, smooth boundary.

C3—51 to 64 inches, dark grayish-brown (10YR 4/2) loamy fine sand; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; massive; loose; few fine roots; mildly alkaline.

The Ap horizon is dark grayish-brown or dark-brown loamy sand to fine sand. The C horizon is dark grayish-brown, brown, or yellowish-brown loamy fine sand to fine sand. Reaction ranges from slightly acid to moderately alkaline throughout the profile.

Crevasse soils are chiefly associated with Robinsonville and Commerce soils, but they are coarser textured and better drained than those soils.

Crevasse soils, frequently flooded (Cr).—This undifferentiated group consists of level to gently undulating soils at the higher elevations bordering the Mississippi River. Generally, the soils are in areas where long, narrow depressions alternate with low ridges that rise 3 to 8 feet above the swales. Slope is less than 3 percent. These soils are in areas 10 to 100 acres in size between the levee and the Mississippi River. They are flooded for periods of 3 to 95 days, generally between January and June. Floods occur on an average of about once every 2 years. The surface layer ranges from loamy sand to fine sand.

Included in mapping were spots of Robinsonville and Commerce soils.

These Crevasse soils are poorly suited to farming. Soybeans is the crop most commonly grown, but winter small grain is grown in some areas. Droughtiness is a very severe limitation for warm-season crops, and cool-season crops are likely to be lost to floods. Soil blowing is a severe hazard in spring if the soil is bare. Crops should be those that leave a large amount of residue. Bermudagrass is a suitable pasture plant. (Capability unit IVw–4; woodland group 3s6)

Dubbs Series

The Dubbs series consists of well-drained, gently undulating soils on older natural levees along bayous and abandoned river channels. These soils formed in stratified beds of loamy sediments.

In a representative profile, the surface layer is dark-brown silt loam about 9 inches thick. The upper part of the subsoil is dark-brown silty clay loam about 19 inches thick, the middle part is dark yellowish-brown, mottled silt loam about 12 inches thick, and the lower part is yellowish-brown, mottled very fine sandy loam that extends to a depth of about 55 inches. The underlying material is brown, mottled fine sandy loam.

Dubbs soils are high in natural fertility. Content of organic matter is medium to low. Permeability is moderate, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Dubbs silt loam, gently undulating, in a moist, cultivated area in NE¼SW¼SW¼ sec. 6, T. 3 S., R. 4 E.:

Ap1—0 to 4 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; common fine roots; slightly acid; abrupt, smooth boundary.

Ap2—4 to 9 inches, dark-brown (10YR 4/3) silt loam; weak, coarse, subangular blocky structure; friable; common fine roots; few pores; slightly acid; abrupt, smooth boundary.

B21t—9 to 28 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; firm; continuous clay films on faces of peds and lining some pores; few fine roots; common pores; few, fine, black concretions; strongly acid; clear, smooth boundary.

B22t—28 to 40 inches, dark yellowish-brown (10YR 4/4) silt loam; few, fine, distinct, light brownish-gray mottles; moderate, medium, subangular blocky structure; firm; patchy clay films on faces of peds; few fine roots; common pores; few, fine, black concretions; strongly acid; clear, smooth boundary.

B3—40 to 55 inches, yellowish-brown (10YR 5/4) very fine sandy loam; few, fine, distinct, light brownish-gray mottles; weak, coarse, subangular blocky structure; friable; few pores; very strongly acid; clear, smooth boundary.

C1—55 to 72 inches, brown (10YR 5/3) fine sandy loam; common, fine, distinct, light brownish-gray mottles; massive; friable; very strongly acid.

The Ap horizon is dark grayish brown, dark brown, or brown. The B horizon is dark brown to yellowish brown and is not mottled in places. The B2 horizon is silty clay or loam or silt loam. The B3 horizon is silt to fine sandy loam. The A horizon is strongly acid to neutral, and the B and C horizons are strongly acid or very strongly acid.

Dubbs soils are chiefly associated with Dundee and Beulah soils. They have less mottling and are better drained than the Dundee soils and are finer textured and have slower internal drainage than Beulah soils.

Dubbs silt loam, gently undulating (DsU).—This soil is in areas where narrow swales alternate with low ridges that rise 2 to 5 feet above the swales. The areas generally are on the tops and slopes of natural levees. Individual areas range from 10 to 100 acres in size. Slope is less than 3 percent. Included in mapping were a few small areas of level soils and spots of Dundee and Beulah soils.

This soil is suited to farming, but runoff is slow to medium and erosion is a moderate hazard on the upper part of slopes. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are cotton (fig. 3) and soybeans. Corn, grain sorghum, peanuts, winter small grain, and such truck crops as okra, green beans, potatoes, sweet corn, tomatoes, strawberries, and melons also are suited. Suitable pasture plants are bermudagrass and white clover. (Capability unit IIe–1; woodland group 2o4)

Dundee Series

The Dundee series consists of somewhat poorly drained, level soils on the lower part of old natural levees along bayous and abandoned river channels. These soils formed in stratified beds of loamy sediments.

In a representative profile, the surface layer is dark grayish-brown silt loam about 7 inches thick. The upper part of the subsoil is grayish-brown, mottled silty clay loam about 12 inches thick, and the lower part is grayish-brown, mottled silt loam that extends to a depth of about 48 inches. The material beneath is light brownish-gray and gray, mottled silt loam and silty clay loam.

Dundee soils are high in natural fertility. Content of organic matter is medium to low. Permeability is moderately slow, and the available water capacity is high.

These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts root penetration and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Dundee silt loam in a moist, cultivated area in SW¼NE¼SE¼ sec. 6, T. 4 S., R. 3 E.:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; medium acid; abrupt, smooth boundary.

B21tg—7 to 11 inches, grayish-brown (10YR 5/2) silty clay loam; common, fine, distinct, strong-brown mottles; moderate, fine and medium, subangular blocky structure; friable; patchy clay films on faces of peds; very strongly acid; clear, smooth boundary.

B22tg—11 to 19 inches, grayish-brown (10YR 5/2) silty clay loam; common, fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; firm; patchy clay films on faces of peds; very strongly acid; clear, smooth boundary.

B23tg—19 to 30 inches, grayish-brown (10YR 5/2) silt loam; few, fine, distinct, strong-brown mottles; weak, coarse, subangular blocky structure; friable; patchy

Figure 3.—Cotton that has been chemically defoliated to hasten maturity on Dubbs silt loam, gently undulating.

clay films on faces of peds; very strongly acid; clear, smooth boundary.

B3g—30 to 48 inches, grayish-brown (10YR 5/2) silt loam; few, fine, distinct, strong-brown mottles; some peds coated with light-gray (10YR 7/2) silt; weak, coarse, subangular blocky structure; friable; strongly acid; clear, smooth boundary.

C1g—48 to 56 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; massive; friable; few, fine, dark concretions; strongly acid; abrupt, wavy boundary.

C2g—56 to 72 inches, gray (5Y 5/1) silty clay loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; massive; firm, slightly plastic; common, fine, black concretions; medium acid.

The A horizon is dark grayish brown to brown. The B horizon is grayish-brown or dark grayish-brown silty clay loam or silt loam. The C horizon is light brownish-gray to gray silty clay loam to fine sandy loam. The A horizon is strongly acid to medium acid, the B horizon is strongly acid or very strongly acid, and the C horizon is slightly acid to very strongly acid.

Dundee soils are chiefly associated with Dubbs, Beulah, Amagon, Arkabutla, and Foley soils. They are grayer and more poorly drained than Dubbs and Beulah soils and have a B horizon of clay accumulation that has a higher content of clay than the B horizon of Beulah soils. They are browner in the upper part of the B horizon than the Amagon soils. The Dundee soils are more acid in the lower part of the B horizon and have a lower content of sodium and magnesium than the Foley soils. They have a B horizon of clay accumulation that Arkabutla soils lack.

Dundee silt loam (Du).—This soil is on the lower part of natural levees. Individual areas range from about 20 to 500 acres in size. Slope is less than 1 percent. Included in mapping were a few small areas of undulating soils and spots of Dubbs, Amagon, Beulah, and Foley soils.

This soil is well suited to farming, but wetness is a moderate hazard. Fieldwork is commonly delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained.

The main crops are cotton (fig. 4) and soybeans. Corn, peanuts, grain sorghum, winter small grains, and such truck crops as okra, green beans, potatoes, sweet corn, tomatoes, strawberries, and melons also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-1; woodland group 2w5)

Falaya Series

The Falaya series consists of somewhat poorly drained, level soils on flood plains of streams. These soils formed in loamy alluvium washed from deposits of loess.

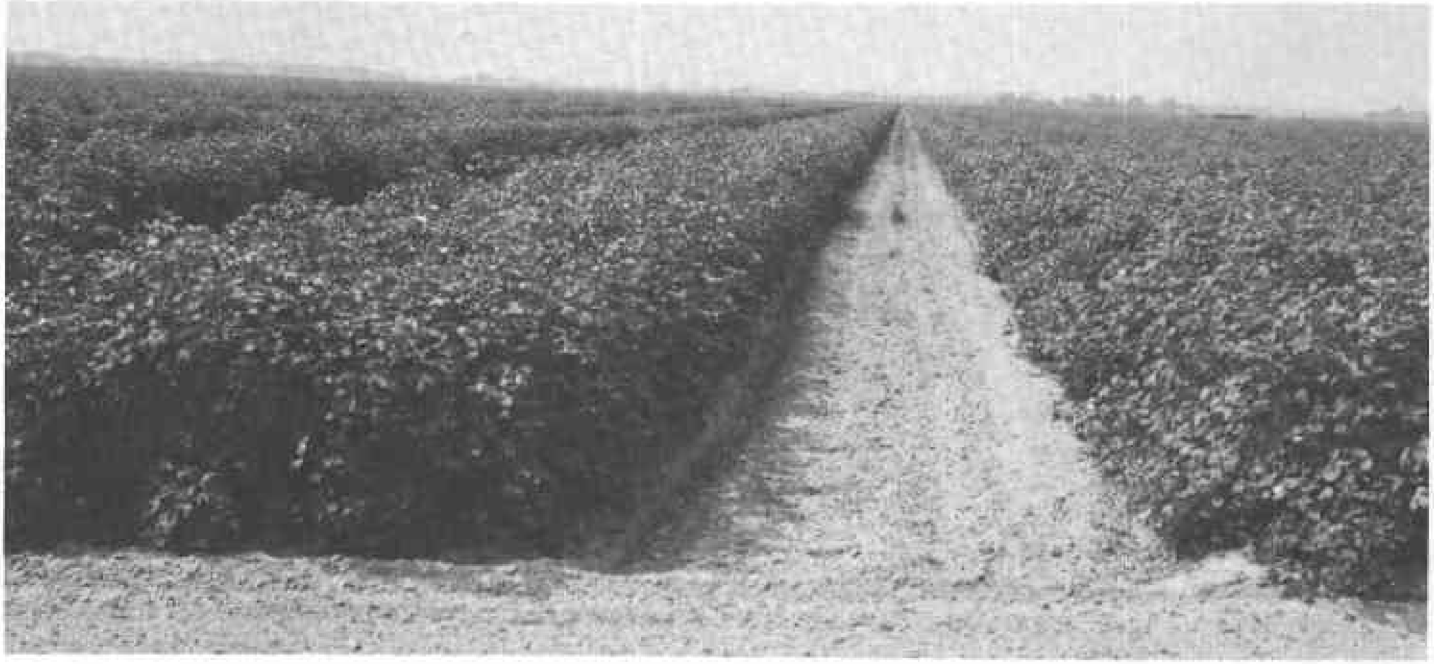

Figure 4.—**Skip-row planting of cotton increases production on this field of Dundee silt loam.**

In a representative profile, the surface layer is silt loam about 17 inches thick. The upper 8 inches is dark yellowish-brown, and the lower 9 inches is dark-brown mottled with light brownish gray. The subsurface layer is light brownish-gray and gray, mottled silt loam about 27 inches thick. The subsoil is gray, mottled silt loam that extends to a depth of 73 inches or more.

Falaya soils are moderate in natural fertility. Content of organic matter is low. Permeability is moderately slow, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Falaya silt loam in a moist, cultivated area in SE¼NW¼SE¼ sec. 31, T. 1 S., R. 4 E.:

Ap—0 to 8 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine granular structure; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

A12—8 to 17 inches, dark-brown (10YR 4/3) silt loam; common, fine, distinct, light brownish-gray mottles; weak, medium, subangular blocky structure; friable; few fine roots; few pores; few, fine, dark concretions; strongly acid; clear, smooth boundary.

A21g—17 to 30 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; friable; few fine roots; few pores; few fine pores; few, fine, dark concretions; very strongly acid; clear, smooth boundary.

A22g—30 to 44 inches, gray (10YR 6/1) silt loam; few, fine and medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, coarse, subangular blocky structure; friable; many pores; common, fine, black concretions; strongly acid; gradual, smooth boundary.

B21g—44 to 61 inches, gray (10YR 6/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; moderate, medium, subangular blocky structure; friable; patchy clay films on faces of peds; common pores; common, fine, black concretions; slightly acid; gradual, smooth boundary.

B22tg—61 to 73 inches, gray (10YR 6/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; weak, medium, subangular blocky structure; patchy clay films on faces of peds; common pores; common, fine, black concretions; neutral.

The Ap and A12 horizons are dark grayish brown, dark brown, or dark yellowish brown. The A2g horizon is light gray, gray, or light brownish gray. The B horizon is gray, light-gray or light brownish-gray silt loam or silty clay loam mottled with dark yellowish brown or yellowish brown. The A horizon is strongly acid or very strongly acid, and the B horizon is strongly acid to neutral.

Falaya soils are chiefly associated with Zachary, Mhoon, and Henry soils. They are better drained and lack the abrupt textural change from the A horizon to the B horizon that the Zachary soils have. They are better drained, are more acid, and have a thicker A horizon than Mhoon soils. They are better drained and lack the fragipan that the Henry soils have.

Falaya silt loam (Fa).—This soil is on flood plains. Individual areas range from about 15 to 180 acres in size. Slope is less than 1 percent. Included in mapping were small areas of soils that are subject to occasional flooding in winter and spring and spots of Zachary and Henry soils.

This soil is suited to farming, but wetness is a moderate hazard. Field work is commonly delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are cotton and soybeans. Grain sorghum and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-1; woodland group 1w8)

Fluvaquents, Frequently Flooded

Fluvaquents, frequently flooded (Ff), consists of somewhat poorly drained and poorly drained soils in borrow pits that are 6 to 15 feet deep. These soils are mainly on the river side of levees, and they are subject to frequent flooding. The areas are chiefly narrow strips that parallel levees. Soil material has been excavated from these areas for use in constructing the levees. The pits have been partly filled with stratified young sediments about 10 to 15 inches thick. These sediments were deposited by water trapped during floods since the pits were excavated. The pits were excavated from about 1935 to 1940.

The soils that have formed in these pits are similar in some respects to the Commerce, Mhoon, Newellton, Sharkey, and Tunica soils. Some of the pits hold water much of the year, and these are well suited to habitat for wetland wildlife. Others are dry most of the year, and willow and cottonwood trees grow in these or they are grazed by cattle. In some pits the walls have been smoothed to make the pits accessible to farm equipment. The soils in these areas are used for catch crops of soybeans or grain sorghum. (Not placed in a capability unit or a woodland group.)

Foley Series

The Foley series consists of poorly drained, level soils on upland flats and on flats adjoining natural levees. These soils formed in thick, loamy deposits of loess and in stratified alluvial sediments.

In a representative profile, the surface layer is silt loam about 8 inches thick. The upper 3 inches is very dark grayish brown, and the lower 5 inches is light gray mottled with yellowish brown. The subsurface layer is gray, mottled silt loam about 4 inches thick. The upper part of the subsoil is gray and grayish-brown, mottled silt loam about 17 inches thick, and the lower part is grayish-brown and gray, mottled silty clay loam that extends to a depth of 60 inches or more.

Foley soils are moderate in natural fertility. Content of organic matter is low. Permeability is slow, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. Because of the high content of sodium and magnesium in the lower part of the subsoil, the effective rooting depth is limited.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Foley silt loam in a moist, idle area in NE¼NE¼NE¼ sec. 3, T. 3 S., R. 1 E.:

Ap1—0 to 3 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, medium, granular structure; very friable; many pores; many fine roots; medium acid; abrupt, smooth boundary.

Ap2—3 to 8 inches, light-gray (10YR 7/1) silt loam; few, fine, distinct, yellowish-brown mottles; weak, medium, platy structure (plowpan); very friable; common fine roots; medium acid; clear, wavy boundary.

A2g—8 to 12 inches, gray (10YR 5/1) silt loam; few, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, platy structure; very friable; common fine roots; strongly acid; clear, wavy boundary.

B21g—12 to 19 inches, gray (10YR 5/1) silt loam; common, coarse, distinct yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to weak, medium, subangular blocky; firm; patchy clay films on faces of peds; peds partly coated with light-gray (10YR 7/1) silt; common fine roots; common pores; strongly acid; gradual, wavy boundary.

B22tg—19 to 24 inches, grayish-brown (2.5Y 5/2) silt loam; few, medium, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, coarse, angular blocky; firm; common patchy clay films on faces of peds; most vertical ped faces coated with light-gray (10YR 7/1) silt; common pores; few plugs of silty clay; very strongly acid; diffuse boundary.

B23tg—24 to 29 inches, gray (10YR 5/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to weak, medium, subangular blocky; friable, gray silt streaks in vertical seams between prisms; clay films on faces of peds; very strongly acid; clear, wavy boundary.

B24tg—29 to 35 inches, grayish-brown (2.5Y 5/2) silty clay loam; few, fine, distinct, yellowish-brown and very dark-brown mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; firm; gray silt streaks in vertical seams between prisms; patchy clay films on faces of peds; few, fine, black concretions; moderately alkaline; gradual, wavy boundary.

B25tg—35 to 60 inches, gray (5Y 5/1) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles and few, fine, distinct, black mottles; moderate, medium, subangular blocky structure; firm; patchy clay films on faces of peds; moderately alkaline.

The Ap1 horizon is very dark grayish brown, dark grayish brown, or dark brown. The Ap2 and A2 horizons are light gray to grayish brown. The B horizon is gray, grayish-brown, or light brownish-gray silt loam or silty clay loam. The A horizon is slightly acid to very strongly acid. The B horizon is very strongly acid to neutral in the upper 16 to 24 inches and neutral to strongly alkaline below.

Foley soils are chiefly associated with Bonn, Calhoun, Calloway, Dundee, and Amagon soils. They are more alkaline in the lower part of the B horizon and have a higher content of sodium and magnesium than Calhoun, Calloway, Dundee, and Amagon soils. They are grayer in the upper part of the B horizon than Calloway soils. Foley soils are more acid and have a lower content of sodium and magnesium in the upper part of the B horizon than Bonn soils.

Foley silt loam (Fo).—This soil is on upland flats and on alluvial flats adjoining natural levees. Individual areas range from about 10 to 800 acres in size. Slope is less than 1 percent. Included in mapping were spots of Calhoun, Calloway, Dundee, and Amagon soils.

This soil is suited to farming, but wetness is a severe limitation. Fieldwork is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used. Land grading is hazardous because of the high content of sodium and magnesium in the lower part of the subsoil. Depth to the sodium-affected layers should be determined before cuts are made. If sodium-affected material is brought to the surface, productivity is impaired.

The main crops are soybeans, cotton, and rice. Grain sorghum also is suited, and winter small grain can be grown if surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw-4; woodland group 3w9)

Grenada Series

The Grenada series consists of moderately well drained, nearly level soils on uplands. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is yellowish-brown silt loam about 7 inches thick. The upper part of the subsoil is yellowish-brown silt loam about 17 inches thick. Below this is a layer of light-gray silt loam about 4 inches thick. The lower part of the subsoil is a firm, brittle, mottled fragipan about 35 inches thick. The upper 4 inches is light-gray silt loam, the next 6 inches is yellowish-brown silty clay loam, the next 11 inches is dark yellowish-brown silty clay loam, and the lower 14 inches is yellowish-brown silt loam. The material beneath, also a part of the fragipan, is silt loam mottled in shades of yellowish brown and light brownish gray.

Grenada soils are moderate in natural fertility. Content of organic matter is low. Permeability is slow, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. They warm early in spring and can be planted early.

Grenada soils are suited to the crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Grenada silt loam, 1 to 3 percent slopes, in a moist, cultivated area in SE¼NW¼NE¼ sec. 34, T. 1 S., R. 3 E.:

Ap—0 to 7 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, granular structure; friable; many fine roots; few pores; few, fine, black concretions; slightly acid; abrupt, smooth boundary.

B21—7 to 19 inches, yellowish-brown (10YR 5/6) silt loam; weak, medium, subangular blocky structure; friable; few fine roots; few worm casts; few, fine, black concretions; strongly acid; clear, smooth boundary.

B22—19 to 24 inches, yellowish-brown (10YR 5/6) silt loam; common, fine, distinct pale-brown mottles; weak, medium, subangular blocky structure; friable; few fine roots; pale-brown silt coatings on faces of some peds; few, medium, black concretions; very strongly acid; clear, wavy boundary.

A'2—24 to 28 inches, light-gray (10YR 7/1) silt loam; many, fine, distinct, yellowish-brown mottles; weak, medium, subangular blocky structure; friable, slightly brittle; many pores; few, fine and medim, black concretions; very strongly acid; abrupt, irregular boundary.

B'x1—28 to 34 inches, yellowish-brown (10YR 5/8) silty clay loam; common, fine, distinct, light-gray mottles; moderate, fine and medium, subangular blocky structure; very firm, compact and brittle; thick continuous clay films on faces of peds; few pores; few, fine and medium, black concretions; strongly acid; gradual, wavy boundary.

B'x2—34 to 45 inches, dark yellowish-brown (10YR 4/4) silty clay loam; common, fine, distinct, light-gray mottles; moderate, medium, subangular blocky structure; firm, compact and brittle; continuous clay films on most faces of peds; few pores; few, medium, black concretions; medium acid; gradual, wavy boundary.

B'x3—45 to 59 inches, yellowish-brown (10YR 5/6) silt loam; common, coarse, faint, dark yellowish-brown 10YR 4/4) mottles and common, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, coarse, subangular blocky structure; firm, compact and brittle; patchy clay films on faces of peds; few pores; few, medium, black concretions; neutral; gradual, wavy boundary.

Cx—59 to 72 inches, mottled yellowish-brown (10YR 5/6), dark yellowish-brown (10YR 4/4), and light brownish-gray (10YR 6/2) silt loam; massive; firm, slightly compact and brittle; common, fine, black concretions; neutral.

The Ap horizon is dark grayish brown to yellowish brown. The B2 horizon is dark yellowish-brown or yellowish-brown silty clay loam. The B22 horizon is mottled pale brown to light gray. The A'2 horizon is light brownish gray, gray, or light gray. The B'x horizon is dark yellowish-brown or yellowish-brown silt loam or silty clay loam. The A horizon is very strongly acid to slightly acid; the B2, A'2, and B'x1 horizons are very strongly acid or strongly acid; the B'x2 horizon is very strongly acid to medium acid; and the B'x3 and Cx horizons are very strongly acid to neutral.

Grenada soils are chiefly associated with Calloway and Loring soils. They lack the mottles in the upper 10 inches of the B horizon that Calloway soils have. They have an A'2 horizon that Loring soils lack.

Grenada silt loam, 1 to 3 percent slopes (GrB).—This moderately well drained soil is on uplands. Individual areas range from about 20 to 50 acres in size. Included in mapping were spots of Calloway and Loring soils.

This soil is suited to farming, but runoff is medium and erosion is a moderate hazard. Clean-tilled crops that leave a large amount of residue can be grown year after year if contour cultivation, terracing on long slopes, and other good management practices are used.

The main crops are cotton and soybeans. Corn, grain sorghum, and winter small grain also are suited. Okra is a suitable truck crop. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIe-2; woodland group 3o7)

Henry Series

The Henry series consists of poorly drained soils on broad upland flats and in depressions. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is dark grayish-brown silt loam about 5 inches thick. The subsurface layer is gray, mottled silt loam about 20 inches thick. The upper part of the subsoil is a firm, brittle fragipan of gray and light brownish-gray, mottled silty clay loam about 24 inches thick, and the lower part is light olive-gray, mottled silt loam that extends to a depth of 60 inches. The material beneath is light brownish-gray, mottled silt loam.

Henry soils are moderate to low in natural fertility. Content of organic matter is low. Permeability is slow, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. Most of the acreage is cultivated.

Representative profile of Henry silt loam in a moist, cultivated area in NW¼NE¼SW¼ sec. 22, T. 1 S., R. 3 E.:

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; few pores; strongly acid; abrupt, smooth boundary.

A21g—5 to 19 inches, gray (10YR 6/1) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; friable; common fine roots; common pores; common, fine, black concretions; strongly acid; clear, smooth boundary.

A22g—19 to 25 inches, gray (10YR 6/1) silt loam; common, medium, distinct, brown (10YR 5/3) mottles; moderate, medium subangular blocky structure; friable; common fine roots; common pores; few, fine, black concretions; strongly acid; clear, smooth boundary.

Bx1—25 to 33 inches, gray (10YR 6/1) silty clay loam; few, medium and fine, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, medium prismatic structure parting to weak, medium, subangular blocky; firm, brittle; common clay films on faces of peds; gray silt in seams between prisms and on faces of peds; common pores; few, fine, black concretions; very strongly acid; clear, smooth boundary.

Bx2—33 to 49 inches, light brownish-gray (10YR 6/2) silty clay loam; few, fine, distinct, light olive-brown mottles; moderate, medium, subangular blocky structure; firm, brittle; patchy clay films on faces of peds; common pores; common, fine and medium, black concretions; very strongly acid; clear, smooth boundary.

B3g—49 to 60 inches, light olive-gray (5Y 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles and common, fine, distinct, brown mottles; weak, coarse, subangular blocky structure; friable; common pores; common, fine, black concretions; strongly acid; clear, smooth boundary.

Cg—60 to 74 inches, light brownish-gray (2.5Y 6/2) silt loam; few, medium, distinct, yellowish-brown (10YR 5/6) and dark yellowish-brown (10YR 4/4) mottles; massive; friable; common, fine, black concretions; slightly acid.

The Ap or A1 horizon is dark gray to brown. The A2g horizon is gray or light brownish gray. The Bx horizon is gray, light olive gray, or light brownish gray. The B3g horizon is silt loam or silty clay loam and has the same range of colors as the Bx horizon. The Ap or A1 horizon is slightly acid to very strongly acid, the A2 and B horizons are very strongly acid or strongly acid, and the C horizon is very strongly acid to mildly alkaline.

Henry soils are chiefly associated with Calhoun, Calloway, Falaya, Jeanerette, Lagrange, and Zachary soils. They have a fragipan that the Calhoun, Falaya, Jeanerette, Lagrange, and Zachary soils lack. Henry soils are grayer than the Calloway soils and lack an A'2 horizon that Calloway soils have. They are more poorly drained than Falaya soils and have an A horizon of higher color value than Jeanerette soils. They are finer textured in the A horizon and the upper part of the B horizon than the Lagrange soils.

Henry silt loam (He).—This poorly drained soil is on broad, upland flats and in depressions. Individual areas range from 20 to 300 acres in size. Slope is less than 1 percent. Included in mapping were spots of Calhoun, Calloway, Falaya, and Zachary soils.

This soil is suited to farming, but wetness is a severe limitation. Fieldwork is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans and cotton. Grain sorghum also is suited, and winter small grain can be grown if surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw-3; woodland group 3w9)

Jeanerette Series

The Jeanerette series consists of poorly drained soils in level to slightly depressional areas on uplands. These soils formed in sediments that are similar to loess but are of uncertain origin.

In a representative profile, the surface layer is silt loam about 16 inches thick. The upper 4 inches is very dark grayish-brown, and the lower 12 inches is black. The upper part of the subsoil is light brownish-gray, mottled silty clay loam about 27 inches thick, and the lower part is light brownish-gray, mottled silt loam about 17 inches thick. The material beneath is gray, mottled silt loam.

Jeanerette soils are moderate to high in natural fertility. Content of organic matter is high. Permeability is moderately slow, and the available water capacity is high. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

If these soils are adequately drained and well managed, they are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Jeanerette silt loam in a moist, cultivated area in SW¼NE¼NE¼ sec. 4, T. 2 S. ,R. 3 E.:

Ap—0 to 4 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable; many fine roots; few, fine, black concretions; medium acid; abrupt, smooth boundary.

A12—4 to 16 inches, black (10YR 2/1) silt loam; weak, fine, granular structure; firm; common fine roots; common, fine, black concretions; slightly acid; gradual, smooth boundary.

B21tg—16 to 28 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, fine, distinct, yellowish-brown mottles; moderate, fine to medium, subangular blocky structure; firm; patchy dark-gray (10YR 4/1) clay films on faces of peds; common, fine, dark concretions; mildly alkaline; gradual, smooth boundary.

B22tg—28 to 43 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common, fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; firm; patchy clay films on faces of peds; common pores; common, medium and fine, calcium carbonate nodules; moderately alkaline, noncalcareous; gradual, smooth boundary.

B3g—43 to 60 inches, light brownish-gray (2.5Y 6/2) silt loam; common, fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; friable; common pores; common, medium and fine, calcium carbonate nodules; moderately alkaline, noncalcareous; gradual, smooth boundary.

Cg—60 to 72 inches, gray (N 6/0) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; friable; moderately alkaline.

The Ap horizon is very dark grayish brown or black. The A12 horizon is black, very dark gray, or very dark grayish brown. The B horizon is dark-gray to light brownish-gray silt loam or silty clay loam. The C horizon has a range of color similar to that of the B horizon. The A horizon is medium acid to neutral, and the B and C horizons are neutral to moderately alkaline.

About 60 percent of this soil has slightly lighter colors in the A and upper B horizons than the defined range of the series, but this difference does not alter its usefulness and behavior.

Jeanerette soils are chiefly associated with the Henry soils. They have a thicker A1 horizon that is lower in color value than that of the Henry soils, and they lack the fragipan that the Henry soils have.

Jeanerette silt loam (Je).—This soil is in slight depressions on uplands. Individual areas range from 15 to 80 acres in size. Slope is less than 1 percent. Included in mapping were spots of soil that has a dark-brown surface layer and spots of Henry soils.

This soil is suited to farming. Wetness is a moderate hazard, and fieldwork can be delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are cotton and soybeans. Corn, grain sorghum, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-1; woodland group 2w6)

Lagrange Series

The Lagrange series consists of poorly drained, level soils on flood plains. These soils formed in moderately thick, loamy deposits that have a high content of sand and are underlain by thick, loamy deposits that have a high content of silt.

In a representative profile, the surface layer is dark yellowish-brown fine sandy loam about 6 inches thick. The upper part of the subsoil is light brownish-gray, mottled fine sandy loam about 19 inches thick, the middle part is gray, mottled fine sandy loam about 8 inches thick, and the lower part is light brownish-gray, mottled silt loam that extends to a depth of about 64 inches. The material beneath is light brownish-gray, mottled silt loam.

Lagrange soils are low in natural fertility. Content of organic matter is low. Permeability is moderately slow, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

These soils are suited to most crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Lagrange fine sandy loam in a moist, cultivated area in SE¼SE¼NE¼ sec. 3, T. 1 S., R. 3 E.:

Ap—0 to 6 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, fine, granular structure; friable; many fine roots; very strongly acid; abrupt, smooth boundary.

B11g—6 to 25 inches, light brownish-gray (10YR 6/2) fine sandy loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; common fine roots; very strongly acid; clear, smooth boundary.

B12g—25 to 33 inches, gray (10YR 6/1) fine sandy loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; weak, coarse, subangular blocky structure; very friable; few fine roots; very strongly acid; abrupt, wavy boundary.

IIB21tg—33 to 47 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, subangular blocky structure; friable; patchy clay films on faces of peds and in pores; few fine roots; common pores; common, fine, dark concretions; very strongly acid; clear, smooth boundary.

IIB22tg—47 to 64 inches, light brownish-gray (10YR 6/2) silt loam; many, medium, distinct, yellowish-brown (10YR 5/4) mottles and dark yellowish-brown (10YR 4/4) mottles; moderate, medium, subangular blocky structure; firm; patchy clay films on faces of peds and in pores; common pores; common, fine and medium, dark concretions; very strongly acid; clear, smooth boundary.

IICg—64 to 72 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; massive; friable; many, medium, dark concretions; strongly acid.

The A horizon is dark yellowish brown, brown, or dark grayish brown. The B1 horizon is light brownish-gray or gray fine sandy loam or sandy loam mottled with brown, yellowish brown, or dark yellowish brown. The IIB and IIC horizons are light brownish gray, light gray, or gray. The A horizon is slightly acid to very strongly acid, and the B and C horizons are strongly acid or very strongly acid.

Lagrange soils are chiefly associated with Henry and Marvell soils. They are coarse-textured in the A horizon and upper part of the B horizon than Henry soils. They are more poorly drained and grayer than Marvell soils.

Lagrange fine sandy loam (La).—This soil is on flood plains. Individual areas range from about 10 to 80 acres in size. Slope is less than 1 percent. Included in mapping were spots of Henry and Marvell soils.

This soil is suited to farming, but wetness is a severe limitation. Fieldwork is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans and cotton. Grain sorghum also is suited, and winter small grain can be grown if surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw-2; woodland group 2w9)

Loring Series

The Loring series consists of moderately well drained, nearly level to gently sloping soils on uplands. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is brown silt loam about 5 inches thick. The upper 4 inches of the subsoil is dark-brown silt loam, and the middle part is dark-brown silty clay loam about 17 inches thick. The lower part is a dark-brown, mottled, brittle, silt loam fragipan about 26 inches thick. The material beneath is dark-brown, mottled silt loam.

Loring soils are moderate in natural fertility. Content of organic matter is low. Permeability is moderately slow, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. The fragipan restricts the penetration of roots and movement of water but does not seriously affect soil productivity or restrict the suitability of the soils for plants. These soils are susceptible to erosion.

These soils are suited to crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Loring silt loam, 1 to 3 percent slopes, in a moist, cultivated area in SW¼NE¼SE¼ sec. 2, T. 2 S., R. 3 E.:

Ap—0 to 5 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B1—5 to 9 inches, dark-brown (7.5YR 4/4) silt loam; moderate, medium, subangular blocky structure; friable; common fine roots; few pores; very strongly acid; clear, smooth boundary.

B2t—9 to 26 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium and fine, subangular blocky structure; firm; continuous clay films on faces of peds; few fine roots; common pores; very strongly acid; clear, smooth boundary.

Bx1—26 to 32 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray

(10YR 6/2) mottles; moderate, medium, subangular blocky structure; firm, compact and brittle; patchy clay films on faces of peds; few pores; few, fine, black concretions; very strongly acid; clear, smooth boundary.

Bx2—32 to 41 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, medium, prismatic structure parting to weak, medium and coarse, subangular blocky; firm, compact and brittle; patchy clay films on faces of peds; light-gray (10YR 7/1) silt coatings on some peds; few pores; common, fine, black concretions; strongly acid; clear, smooth boundary.

Bx3—41 to 52 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/4) mottles; weak, coarse, subangular blocky structure; firm, compact and brittle; patchy clay films on faces of peds; light-gray (10YR 7/1) silt coatings on some peds; few pores; few, fine, black concretions; strongly acid; clear, smooth boundary.

C—52 to 72 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/4) mottles; massive; friable; strongly acid.

The A horizon is brown, dark grayish brown, grayish brown, or yellowish brown. The B horizon is dark-brown or strong-brown silt loam or silty clay loam. Depth to the Bx horizon is 24 to 32 inches. The Bx horizon is dark brown or strong brown. The C horizon is dark brown, strong brown, or yellowish brown. The A horizon is strongly acid to slightly acid, and the B and C horizons are very strongly acid or strongly acid.

Loring soils are chiefly associated with Memphis and Grenada soils. They have a mottled fragipan that the Memphis soils lack, and they lack the A'2 horizon that Grenada soils have.

Loring silt loam, 1 to 3 percent slopes (LoB).—This moderately well drained soil is on uplands. Individual areas range from about 20 to 150 acres in size. The profile of this soil is the one described as representative for the series. Included in mapping were spots of Memphis and Grenada soils.

This soil is suited to farming, but runoff is medium and erosion is a moderate hazard. Clean-tilled crops that leave a large amount of residue can be grown year after year if contour cultivation, terracing on long slopes, and other good management practices are used.

The main crops are cotton and soybeans. Corn, grain sorghum, okra, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIe–2; woodland group 3o7)

Loring silt loam, 3 to 8 percent slopes, eroded (LoC2).—This moderately well drained soil is on uplands. Individual areas range from 20 to 50 acres in size. The profile of this soil is similar to the one described as representative for the series, but most of the original surface layer has been removed by erosion, and the plow layer is a mixture of the original surface layer and the subsoil. Most areas have a few rills. Included in mapping were a few small areas of soils that have slopes of more than 8 percent, a few spots of soils that have shallow gullies, and spots of Memphis soils.

This soil is suited to farming, but runoff is medium to rapid and erosion is a severe hazard. Sown crops that leave a large amount of residue can be safely grown year after year if contour cultivation and terracing and other good management practices are used. Clean-tilled crops can be grown most years if the cropping system includes a sod crop or a winter cover crop. In areas where length and gradient of slope increase, there is need for more intensive conservation treatment. The surface layer of this soil puddles and crusts over readily after a rain because of low content of organic matter and weak structure.

The main crops are cotton and soybeans. Corn, grain sorghum, okra, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIe–1; woodland group 3o7)

Marvell Series

The Marvell series consists of well-drained, level soils on flood plains. These soils formed in moderately thick, loamy deposits that have a high content of sand and are underlain by thick loamy deposits that have a high content of silt.

In a representative profile, the surface layer is brown fine sandy loam about 15 inches thick. The upper part of the subsoil is brown fine sandy loam about 21 inches thick, the middle part is yellowish-brown, mottled silt loam about 17 inches thick, and the lower part is light-gray, mottled silt loam that extends to a depth of 65 inches or more.

Marvell soils are moderate in natural fertility. Content of organic matter is low. Permeability is moderately slow, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed below the plow layer. This pan restricts penetration of roots and movement of water through the soil. These soils warm early in spring and can be planted early.

These soils are suited to most of the crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Marvell fine sandy loam in a moist, cultivated area in SW¼SW¼SW¼ sec. 8, T. 2 S., R. 2 E.:

Ap—0 to 6 inches, brown (7.5YR 5/4) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; few, fine, black concretions; medium acid; abrupt, smooth boundary.

A12—6 to 15 inches, brown (7.5YR 5/4) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; few, fine, black concretions; medium acid; clear, smooth boundary.

B11—15 to 23 inches, (7.5YR 5/4) fine sandy loam; weak, medium, subangular blocky structure; very friable; common fine roots; medium acid; clear, smooth boundary.

B12—23 to 36 inches, brown (7.5YR 5/4) fine sandy loam; weak, medium, subangular blocky structure; very friable; few fine roots; common, fine, pale-brown patches of clean sand grains; common, fine, black concretions; medium acid; abrupt, smooth boundary.

IIB21t—36 to 53 inches, yellowish-brown (10YR 5/8) silt loam; common, fine, distinct, light-gray mottles; weak, medium, subangular blocky structure; friable; patchy clay films in pores and on faces of peds; common pores; many, fine, black concretions; medium acid; gradual, smooth boundary.

IIB22tg—53 to 65 inches, light-gray (10YR 7/2) silt loam; common, fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; friable; patchy clay films on faces of peds; common pores; many, fine, black concretions; medium acid.

The A horizon is grayish brown to dark yellowish brown. The B1 horizon is brown to dark yellowish-brown sandy loam or fine sandy loam. The IIB21t horizon is yellowish brown or brown, mottled light gray or light brownish gray. The IIB22t horizon is light gray or light brownish gray. Reaction is strongly acid or medium acid throughout the profile.

Marvell soils are chiefly associated with Calloway and Lagrange soils. They are better drained and have browner colors than those soils. They are coarser textured in the A horizon and the upper part of the B horizon than the Calloway soils and lack the fragipan of those soils.

Marvell fine sandy loam (Ma).—This soil is on flood plains. Individual areas range from about 10 to 60 acres in size. Slope is less than 1 percent. Included in mapping were small areas of soils that have slopes of as much as 2 percent and spots of Calloway and Lagrange soils.

This soil is well suited to farming. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are cotton and soybeans. Corn, grain sorghum, peanuts, and winter small grain also are suited. Such truck crops as okra, green beans, potatoes, sweet corn, tomatoes, and melons are well suited. Suitable pasture plants are bermudagrass and white clover. (Capability unit I–1; woodland group 2o4)

Memphis Series

The Memphis series consists of well-drained, nearly level to steep soils on uplands. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is dark yellowish-brown silt loam about 5 inches thick. The upper 4 inches of the subsoil is dark-brown silt loam, the middle part is dark-brown silty clay loam about 34 inches thick, and the lower part is dark-brown silt loam to sandy loam. The underlying material is dark-brown and strong-brown silt loam to sandy loam.

Memphis soils are moderate in natural fertility, and the content of organic matter is medium to low. Permeability is moderate, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain.

Nearly level and gently sloping areas are suited to most of the commonly grown crops, but control of erosion and other careful management are needed. Steeper areas are poorly suited or unsuited to crops but are suited to pasture, except where slopes are too steep to permit good pasture management. The steeper areas are well suited to woodland, and most are used for this purpose. Some tracts are within the St. Francis National Forest.

Representative profile of Memphis silt loam, 1 to 3 percent slopes, in a moist, cultivated area in NE¼SE¼NW¼ sec. 19, T. 2 S., R. 1 E.:

Ap—0 to 5 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; friable; many fine roots; slightly acid; abrupt, smooth boundary.

B1t—5 to 9 inches, dark-brown (7.5YR 4/4) silt loam; weak, medium, subangular blocky structure; friable; few patchy clay films on faces of peds; some pores lined with clay; common fine roots; common pores; strongly acid; clear, smooth boundary.

B21t—9 to 22 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium subangular blocky structure; firm; continuous clay films on faces of peds; some pores lined with clay; few fine roots; common pores; few, fine, dark concretions; dark coatings on some ped faces; strongly acid; clear, smooth boundary.

B22t—22 to 43 inches, dark-brown (7.5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; firm; continuous clay films on faces of peds; few fine roots; few pores; few, fine, dark concretions; dark coatings on faces of some peds; very strongly acid; gradual, smooth boundary.

B23t—43 to 55 inches, dark-brown (7.5YR 4/4) silt loam; moderate, medium, subangular blocky structure; friable; patchy clay films on faces of peds; few pores; gray silt coatings on some faces of peds; few, fine, dark concretions; very strongly acid; gradual, smooth boundary.

IIC1—55 to 67 inches, dark-brown (7.5YR 4/4) loam; massive; friable; few, fine, dark concretions; very strongly acid; gradual, smooth boundary.

IIC2—67 to 80 inches, strong-brown (7.5YR 5/6) sandy loam; coarse platy structure; friable; stratified layers of yellowish-brown (10YR 5/6) loamy fine sand about 1 inch thick; medium acid.

The A horizon is dark brown, brown, or dark yellowish brown. The B horizon is silt loam or silty clay loam. The IIC horizon is loam to sandy loam. In many places the IIC horizon is not present, and the C horizon is dark-brown friable silt loam. The A horizon is slightly acid to strongly acid, the B horizon is strongly acid or very strongly acid, and the C horizon is very strongly acid to medium acid. The IIC horizon is very strongly acid to medium acid.

Memphis soils are chiefly associated with Loring and Natchez soils. They are free of mottles and do not have the fragipan that is characteristic of the Loring soils. Memphis soils are more acid in the B horizon than Natchez soils, and they have an accumulation of translocated clay that is lacking in these soils.

Memphis silt loam, 1 to 3 percent slopes (MeB).—This well-drained soil is on uplands. Individual areas range from about 20 to 200 acres in size. The profile of this soil is the one described as representative for the series. Included in mapping were small spots of Loring and Grenada soils.

This soil is suited to farming, but runoff is medium and erosion is a moderate hazard. Clean-tilled crops that leave a large amount of residue can be grown year after year if contour cultivation, terracing on long slopes, and other good management practices are used.

The main crops are cotton and soybeans. Corn, grain sorghum, okra, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIe–2; woodland group 2o7)

Memphis silt loam, 3 to 8 percent slopes, eroded (MeC2).—This well-drained soil is on uplands. Individual areas range from 20 to 100 acres in size. The profile of this soil is similar to the one described as representative for the series, but most of the original surface layer has been removed by erosion and the plow layer is a mixture of the original surface layer and the subsoil. Included in mapping were a few spots of Loring soils and a few gullied spots.

This soil is suited to farming, but runoff is medium to rapid and erosion is a severe hazard.

Sown crops that leave a large amount of residue can be safely grown year after year if contour cultivation and terracing and other good management practices are used. Clean-tilled crops can be grown most years if the cropping system includes a sod crop or a winter cover crop. In areas where length and gradient of slope increase, there is need for more intensive conservation treatment. The surface layer of this soil puddles and crusts over readily after a rain because of the low content of organic matter and weak structure.

The main crops are cotton and soybeans. Other suitable crops are corn, grain sorghum, okra, and winter small grain. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIc–1; woodland group 2o7)

Memphis silt loam, 8 to 12 percent slopes, eroded (MeD2).—This is a well-drained soil on uplands. Individual areas range from 20 to 60 acres in size. The profile of this soil is similar to the one described as representative for the series, but erosion has removed some of the original surface layer and exposed patches of subsoil. Plowing has mixed the original surface layer with part of the subsoil in places. Included in mapping were a few spots of Loring soils and a few gullied spots.

Runoff is rapid, and the hazard of erosion is very severe. This soil is poorly suited to cultivated crops. Sown crops can be safely grown occasionally if the soil is in close-growing cover most of the time. The soil is suited to pasture. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IVe–1; woodland group 2o7)

Memphis silt loam, 12 to 40 percent slopes (MeE).—This well-drained soil is on uplands. Individual areas range up to several hundred acres in size. Included in mapping were spots of Loring and Natchez soils, a few gullied spots, and a few gravel pits.

Runoff is very rapid, and the hazard of erosion is very severe. This soil is not suited to cultivated crops and is poorly suited to pasture. It is better suited to woodland, and most of the acreage is used for this purpose. Some of the acreage is in urban and built-up areas. (Capability unit VIIe–1; woodland group 2r8)

Mhoon Series

The Mhoon series consists of poorly drained level soils on flood plains. These soils formed in stratified beds of loamy sediments.

In a representative profile, the surface layer is dark grayish-brown silt loam about 5 inches thick. The upper part of the subsoil is gray, mottled silt loam about 6 inches thick, the middle part is grayish-brown, mottled silty clay loam about 15 inches thick, and the lower part is gray, mottled silt loam that extends to a depth of about 42 inches. The material beneath is gray and light brownish-gray, mottled, stratified silty clay loam and silt loam.

Mhoon soils are high in natural fertility. Content of organic matter is medium to low. Permeability is slow, and the available water capacity is high. These soils respond well to fertilizer, and good tilth is easy to maintain. In places a plowpan has formed beneath the plow layer. This pan restricts penetration of roots and movement of water through the soil.

Because of frequent flooding, these soils are suited to only warm-season annual crops that require a short growing season. About one-fifth of the acreage is cultivated, and most of the remaining acreage is wooded.

Representative profile of Mhoon silt loam in an area of Mhoon soils, frequently flooded, in a moist, wooded area in NE¼NE¼NW¼ sec. 3, T. 1 S., R. 2 E.:

O1—1 inch to 0, partially decomposed, matted hardwood leaves and twigs.

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; slightly acid; clear, smooth boundary.

B1g—5 to 11 inches, gray (10YR 5/1) silt loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; many fine roots; few, fine, black concretions; slightly acid; clear, smooth boundary.

B2g—11 to 26 inches, grayish-brown (2.5Y 5/2) silty clay loam; few, fine, faint, pale-olive mottles; weak, coarse, subangular blocky structure; firm; few fine roots; few pores; few, fine, black concretions; slightly acid; clear, smooth boundary.

B3g—26 to 42 inches, gray (10YR 6/1) silt loam; few, fine, faint, pale-olive mottles; weak, coarse and medium, subangular blocky structure; friable; few fine roots; few pores; few, fine, black concretions; mildly alkaline; clear, smooth boundary.

C1g—42 to 61 inches, gray (10YR 6/1) silty clay loam; few, medium, faint, pale-olive mottles; massive; firm; few, fine, black concretions; few calcium nodules; mildly alkaline; clear, smooth boundary.

C2g—61 to 82 inches, light brownish-gray (10YR 6/2) silt loam; common, medium and fine, dark yellowish-brown (10YR 4/4) mottles; massive; friable; common, fine, black concretions; common calcium nodules; mildly alkaline.

The A horizon is dark grayish-brown to gray silt loam or silty clay loam. The B horizon is dark gray to grayish brown. The C horizon is gray or light brownish gray. Texture of the layers of the B and C horizons is variable because of the stratification of the parent material. Dominant textures are silt loam, clay loam, and silty clay loam. The A horizon is slightly acid or neutral, the B horizon is slightly acid to mildly alkaline, and the C horizon is neutral to moderately alkaline.

Mhoon soils are chiefly associated with Zachary and Falaya soils. They are less acid than the Zachary and Falaya soils, lack the abrupt textural change between the A and B horizons of the Zachary soils, and lack the thick A horizon and the B horizon of clay accumulation that Falaya soils have.

Mhoon soils, frequently flooded (Mh).—This undifferentiated group consists of soils on flood plains, mainly along Big Creek. Individual areas are as much as several hundred acres in size. Slope is less than 1 percent. These soils are flooded for periods of about 1 week to 4 months, generally between January and June. Floods occur 9 years in 10. The surface layer is silt loam or silty clay loam. Included in the mapping were spots of Zachary and Falaya soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if good management is used.

The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw–2; woodland group 1w6)

Natchez Series

The Natchez series consists of well-drained, steep soils on uplands. These soils formed in thick deposits of loess.

In a representative profile, the surface layer is silt loam about 11 inches thick. The upper 4 inches is dark grayish brown, and the lower 7 inches is dark brown. The upper 8 inches of the subsoil is dark yellowish-brown silt loam, and the lower 14 inches is dark-brown silt loam. The material beneath is dark yellowish-brown silt loam.

Natchez soils are high in natural fertility. Content of organic matter is medium. Permeability is moderately rapid, and the available water capacity is high.

Because of steep slopes and the severe hazard of erosion, these soils are unsuited to cultivated crops. The soils are used for woodland and wildlife habitat or are in urban and built-up areas. Some tracts are within the St. Francis National Forest.

Representative profile of Natchez silt loam, 20 to 40 percent slopes, in a moist, wooded area in NW¼NE¼ NW¼ sec. 20, T. 2 S., R. 5 E.:

O1—1 inch to 0, partially decomposed, matted hardwood leaves and twigs.

A11—0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; many fine roots; neutral; clear, smooth boundary.

A12—4 to 11 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; mildly alkaline; clear, smooth boundary.

B1—11 to 19 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, coarse, subangular blocky structure; friable; common fine roots; moderately alkaline; gradual, smooth boundary.

B2—19 to 33 inches, dark-brown (7.5YR 4/4) silt loam; weak, coarse, subangular blocky structure; friable; few fine roots; mildly alkaline; gradual, smooth boundary.

C—33 to 72 inches, dark yellowish-brown (10YR 4/4) silt loam; massive; very friable; few fine roots; moderately alkaline.

The A horizon is dark grayish brown to dark yellowish brown. The B horizon is dark brown to yellowish brown. The C horizon is dark brown or dark yellowish brown. The A horizon is slightly acid to mildly alkaline, the B horizon is neutral to moderately alkaline, and the C horizon is mildly alkaline or moderately alkaline.

Natchez soils are chiefly associated with Memphis soils. They lack a B horizon of translocated clay accumulation that the Memphis soils have, and they are more alkaline in the B horizon than those soils.

Natchez silt loam, 20 to 40 percent slopes (NaE).—This well-drained soil is on uplands (fig. 5). Individual areas range up to several hundred acres in size. Included in mapping were spots of Memphis soils and narrow strips of Convent soils along drainageways.

Runoff is very rapid, and erosion is a very severe hazard. This soil is not suited to cultivated crops and is poorly suited to pasture. It is better suited to trees, and most of it is used for this purpose. Some of the acreage is in urban and built-up areas. (Capability unit VIIe-1; woodland group 2r8)

Newellton Series

The Newellton series consists of somewhat poorly drained, level and gently undulating soils at high elevations in slack-water areas. These soils formed in thin beds of clayey sediments over coarser textured sediments.

In a representative profile, the surface layer is dark grayish-brown silty clay about 4 inches thick. The subsoil is dark grayish-brown, mottled silty clay that extends

Figure 5.—A road cut showing a vertical bluff, a characteristic of the thick loess in which Natchez silt loam, 20 to 40 percent slopes, formed.

to a depth of about 15 inches. The material beneath is dark grayish-brown and grayish-brown, mottled, stratified silt loam to loamy fine sand.

Newellton soils are moderate to high in natural fertility. Content of organic matter is medium. Permeability is slow, and the available water capacity is high. These soils respond well to fertilizer. Good tilth is difficult to maintain and seedbeds are difficult to prepare because of the high content of clay in the surface layer. These soils clod if plowed when wet. They shrink and crack when they dry, and when wet they expand and the cracks seal.

If these soils are drained and well managed, they are suited to most crops grown in the county. Most of the acreage is cultivated. Part of the acreage is within the White River National Wildlife Refuge.

Representative profile of Newellton silty clay, gently undulating, in a moist, cultivated area in NW¼SW¼ NW¼ sec. 13, T. 5 S., R. 2 E.:

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silty clay; few, fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; firm, plastic; many fine roots; neutral; abrupt, smooth boundary.

B—4 to 15 inches, dark grayish-brown (10YR 4/2) silty clay; common, medium, faint, dark-gray (10YR 4/1) mottles and common, fine, distinct, dark yellowish-brown mottles; moderate, medium, subangular blocky structure; firm, plastic; common fine roots; common pores; few, fine, black concretions; neutral; clear, smooth boundary.

IIC1—15 to 22 inches, dark grayish-brown (10YR 4/2) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; common fine roots; common pores; few, fine, black concretions; mildly alkaline; clear, smooth boundary.

IIIC2—22 to 39 inches, grayish-brown (10YR 5/2) fine sandy loam; common, medium, faint, light brownish-gray (10YR 6/2) mottles and common, fine, distinct, yellowish-brown mottles; massive; friable; few fine roots; moderately alkaline; clear, smooth boundary.

IVC3—39 to 72 inches, grayish-brown (10YR 5/2) loamy fine sand; massive to platy structure, loose; common bedding planes; moderately alkaline.

The A horizon is grayish-brown, dark grayish-brown, or dark-gray clay to silty clay loam. The B horizon is dark-gray, gray, or dark grayish-brown clay or silty clay. The IIC horizon is gray, dark grayish-brown, grayish-brown, or light brownish-gray silt loam to loamy fine sand. The IIIC and IVC horizons are lacking in places. The A and B horizons are slightly acid to mildly alkaline, and the IIC, IIIC, and IVC horizons, where present, are neutral to moderately alkaline.

Newellton soils are chiefly associated with the Tunica, Sharkey, and Commerce soils. They formed in thinner beds of clayey sediments and are better drained internally than the Tunica and Sharkey soils. They have a B horizon that contains more clay than the Commerce soils.

Newellton silty clay (Ne).—This soil is on the higher part of slack-water areas. Individual areas range from about 15 to 200 acres in size. Slope is less than 1 percent. Included in mapping were spots of Tunica, Sharkey, and Commerce soils.

This soil is suited to farming, but wetness is a moderate limitation. Fieldwork frequently is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are cotton and soybeans. Alfalfa, grain sorghum, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIw-3; woodland group 2w5)

Newellton silty clay, gently undulating (NeU).—This soil is in areas where long, narrow swales alternate with low ridges that rise 2 to 5 feet above the swales. Individual areas range from about 10 to 200 acres in size. Slope is less than 3 percent. The profile of this soil is the one described as representative for the series. Included in mapping were spots of Tunica, Sharkey, and Commerce soils.

This soil is suited to farming, but wetness is a severe limitation. Water accumulates in the swales. Fieldwork is delayed several days after a rain unless surface drains are installed. Land grading and smoothing can be done, but careful planning is needed. Deep cuts in the ridges expose the permeable underlying material, and material from the clayey upper layers is moved into the depressions. This results in narrow strips of loamy soil that alternate with narrow strips of clayey soil across the graded field. Thus, a field may be more difficult to manage after grading than before. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and good management is used.

The main crops are cotton and soybeans. Alfalfa, grain sorghum, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw-1; woodland group 2w5)

Newellton soils, frequenty flooded (Nf).—This undifferentiated group consists of level and gently undulating soils at the higher elevations in slack-water areas. Individual areas range from about 15 to 100 acres in size. Slope is less than 3 percent. The profile of these soils is similar to the one described as representative for the series, but the surface layer ranges from clay to silty clay loam. These soils are mainly between the Mississippi and its levee, but a few areas are between the White River and its levee. They are flooded for periods of 3 to 95 days, generally between January and June. Floods occur on an average of about once every 2 years. Included in mapping were spots of Tunica, Sharkey, and Commerce soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if good management is used.

The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw-1; woodland group 3w6)

Robinsonville Series

The Robinsonville series consists of well-drained, level soils on higher parts of young natural levees. These soils formed in stratified loamy sediments.

In a representative profile, the surface layer is dark grayish-brown fine sandy loam about 7 inches thick. The material beneath is dark-brown, stratified very fine sandy loam, loamy fine sand, fine sandy loam, and loamy very fine sand that extends to a depth of 72 inches or more.

Robinsonville soils are moderate to high in natural fertility. Content of organic matter is medium to low.

Permeability is moderately rapid, and the available water capacity is moderate. These soils respond well to fertilizer, and good tilth is easy to maintain. A plowpan has formed beneath the plow layer in places. This pan restricts penetration of roots and movement of water through the soil. These soils warm early in spring and can be planted early.

If these soils are protected from flooding, they are well suited to crops commonly grown in the county. Nearly all of the acreage is cultivated.

Representative profile of Robinsonville fine sandy loam in a moist, cultivated area in SE¼SE¼NW¼ sec. 6, T. 3 S., R. 5 E.:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; slightly acid; abrupt, smooth boundary.

C1—7 to 22 inches, dark-brown (10YR 4/3) very fine sandy loam; massive; very friable; few fine roots; neutral; abrupt, smooth boundary.

C2—22 to 29 inches, dark-brown (10YR 4/3) loamy fine sand; massive; loose; few fine roots; common, horizontal, darker streaks on bedding planes; neutral; clear, smooth boundary.

C3—29 to 33 inches, dark-brown (10YR 4/3) fine sandy loam; massive; very friable; few fine roots; neutral; clear, smooth boundary.

C4—33 to 48 inches, dark-brown (10YR 4/3) loamy fine sand; massive; loose; mildly alkaline; clear, smooth boundary.

C5—48 to 63 inches, dark-brown (10YR 4/3) loamy very fine sand; massive; very friable; common bedding planes and thin lenses of fine sandy loam; moderately alkaline; clear, smooth boundary.

C6—63 to 72 inches, dark-brown (10YR 4/3) fine sandy loam; massive; very friable; many bedding planes; moderately alkaline.

The A horizon is dark grayish-brown, dark brown, or dark yellowish-brown very fine sandy loam to loamy fine sand. The C horizon is dark-brown, brown, or yellowish-brown very fine sandy loam to loamy sand that is stratified but has no regular sequence. Reaction ranges from slightly acid to moderately alkaline throughout the profile.

Robinsonville soils are chiefly associated with Crevasse and Commerce soils. They are finer textured than the Crevasse soils, having formed in predominantly loamy rather than sandy sediments. They are not so gray and are better drained than Commerce soils, and they lack the B horizon that those soils have.

Robinsonville fine sandy loam (Ro).—This soil is on the higher part of young natural levees. Individual areas range from 15 to 130 acres in size. Slope is less than 1 percent. The profile of this soil is the one described as representative of the series. Included in mapping were small areas of an undulating soil and spots of Commerce and Crevasse soils.

This soil is well suited to farming. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are cotton and soybeans. Corn, grain sorghum, peanuts, and winter small grain also are suited. Truck crops, including okra, green beans, potatoes, sweet corn, tomatoes, and melons, are well suited. Suitable pasture plants are bermudagrass and white clover. (Capability unit I-1; woodland group 1o4)

Robinsonville soils, frequently flooded (Rs).—This undifferentiated group consists of level and gently undulating soils on the higher part of natural levees. Individual areas range from 15 to 80 acres in size. Slope is less than 3 percent. The profile of these soils is similar to the one described as representative of the series, but the surface layer ranges from very fine sandy loam to loamy fine sand. These soils are between the Mississippi River and its levee. They are flooded for periods of 3 to 95 days, generally between January and June. Floods occur an average of about once every 2 years. Included in mapping were spots of Commerce and Crevasse soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crop is soybeans. Some cotton is grown, but the crop is sometimes lost because of flooding. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw-3; woodland group 1o4)

Sharkey Series

The Sharkey series consists of poorly drained, dominantly level soils in slack-water areas. These soils formed in thick beds of clayey sediments.

In a representative profile, the surface layer is very dark grayish-brown silty clay about 5 inches thick. The subsoil is dark-gray, mottled clay about 14 inches thick. The material beneath is dark-gray, mottled clay that extends to a depth of 72 inches or more.

Sharkey soils are high in natural fertility. Content of organic matter is medium to high. Permeability is very slow, and the available water capacity is high. These soils respond well to fertilizer. Good tilth is difficult to maintain, and seedbeds are difficult to prepare because of the high content of clay. These soils clod if plowed when wet. They shrink and crack when they dry, and when wet they expand and the cracks seal.

If these soils are drained and well managed, they are suited to most crops grown in the county. Most of the acreage is cultivated, but some large areas are within the White River National Wildlife Refuge.

Representative profile of Sharkey silty clay in a moist, cultivated area in NW¼SW¼NW¼ sec. 28, T. 4 S., R. 3 E.:

Ap—0 to 5 inches, very dark grayish-brown (10YR 3/2) silty clay; weak, fine, subangular blocky structure; firm, plastic; common fine roots; neutral; clear, smooth boundary.

B21g—5 to 19 inches, dark-gray (10YR 4/1) clay; common, medium, distinct, dark-brown (7.5YR 4/4) mottles; moderate, fine, subangular blocky structure; firm, very plastic; neutral; clear, smooth boundary.

B22g—19 to 31 inches, dark-gray (10YR 4/1) clay; common, medium, distinct, dark-brown (7.5YR 4/4) mottles; moderate, medium, subangular blocky structure; firm, very plastic; neutral; gradual, smooth boundary.

B3g—31 to 46 inches, dark-gray (10YR 4/1) clay; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, subangular blocky structure; firm, very plastic; neutral; gradual, smooth boundary.

C1g—46 to 58 inches, dark-gray (10YR 4/1) clay; common, medium, distinct, dark-brown (10YR 4/3) mottles; weak, medium, subangular blocky structure; firm, very plastic; common, fine, calcium carbonate nodules; mildly alkaline; gradual, smooth boundary.

C2g—58 to 65 inches, dark-gray (10YR 4/1) clay; common, medium, distinct, dark-brown (10YR 4/3) and dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; firm, very plastic; common, fine, calcium carbonate nodules; mildly alkaline; gradual, smooth boundary.

C3g—65 to 72 inches, dark-gray (10YR 4/1) clay; common, medium, distinct, dark-brown (7.5YR 4/4) mottles; weak, medium, subangular blocky structure; firm; very plastic; moderately alkaline.

The A horizon is very dark gray, very dark grayish-brown, dark-brown, dark-gray, or dark grayish-brown silty clay loam to clay. The B and C horizons are dark gray or gray. Reaction ranges from slightly acid to moderately alkaline throughout the profile.

Sharkey soils are chiefly associated with Tunica, Newellton, and Alligator soils. They formed in thicker beds of clayey sediments than the Tunica and Newellton soils. They closely resemble the Alligator soils but are not so acid to a depth of 40 inches or more.

Sharkey silty clay (Sh).—This soil is on broad flats. Individual areas range up to several thousand acres in size. Slope is less than 1 percent. The profile of this soil is the one described as representative of the series. Included in the mapping were small areas of gently undulating soils and spots of Tunica and Newellton soils.

This soil is suited to farming, but wetness is a severe limitation. Fieldwork frequently is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are soybeans (fig. 6) and cotton. Rice, alfalfa, grain sorghum, winter small grain, and okra also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw–1; woodland group 2w6)

Sharkey soils, frequently flooded (Sk).—This undifferentiated group consists of soils on broad flats. Individual areas range to several hundred acres in size. Slope is less than 1 percent. The profile of these soils is similar to the one described as representative for the series, but the surface layer ranges from silty clay loam to clay. These soils are between the Mississippi River and its levee, the White River and its levee, and along the lower reaches of Big Creek. Generally, these soils are flooded between January and June for periods of 3 to 95 days along the Mississippi River and for periods from about 1 week to 4 months along the White River and Big Creek. Floods occur on an average of about once every 2 years along the Mississippi River and about 9 years in 10 along the White River and Big Creek. Included in mapping were spots of Tunica and Newellton soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw–1; woodland group 3w6)

Tunica Series

The Tunica series consists of poorly drained, level to gently undulating soils in broad slack-water areas. These soils formed in thin beds of clayey sediments over coarser textured sediments.

In a representative profile, the surface layer is dark grayish-brown silty clay about 5 inches thick. The sub-

Figure 6.—Soybean residue plowed under in fall on a field of Sharkey silty clay. The residue will decompose, and weather extremes will crumble the clayey soil into a good seedbed.

soil is dark-gray, mottled silty clay that extends to a depth of about 27 inches. Below this is dark-brown and light brownish-gray, mottled fine sandy loam and loam underlain by pale-brown, mottled sand.

Tunica soils are moderate to high in natural fertility. Content of organic matter is medium. Permeability is very slow, and the available water capacity is high. These soils respond well to fertilizer. Tilth is difficult to maintain and seedbeds are difficult to prepare because of the high content of clay in the surface layer. These soils clod if plowed when wet. They shrink and crack when they dry, and when wet they expand and the cracks seal.

If these soils are adequately drained and well managed, they are suited to most crops grown in the county. Most of the acreage is cultivated. A few areas are within the White River National Wildlife Refuge.

Representative profile of Tunica silty clay, gently undulating, in a moist, cultivated area in SW¼NE¼NE¼ sec. 31, T. 4 S., R. 3 E.:

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) silty clay; weak, medium and fine, subangular blocky structure; firm, plastic; many fine roots; neutral; abrupt, smooth boundary.

B21g—5 to 10 inches, dark-gray (10YR 4/1) silty clay; common, fine, dark-brown mottles; weak, medium, subangular blocky structure; firm, plastic; common fine roots; few pores; few, fine, black concretions; neutral; abrupt, smooth boundary.

B22g—10 to 27 inches, dark-gray (10YR 4/1) silty clay; common, medium and fine, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, subangular blocky structure; firm, plastic; few fine roots; common pores; few, fine, black concretions; neutral; abrupt, smooth boundary.

IIC1—27 to 36 inches, dark-brown (10YR 4/3) fine sandy loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles and few, fine, distinct, yellowish-brown mottles; massive; friable; few fine roots; few, fine, black concretions; neutral; clear, wavy boundary.

IIC2g—36 to 55 inches, light brownish-gray (10YR 6/2) loam; common, medium, distinct, dark-brown (10YR 4/3) mottles; massive; friable; few, fine, black concretions; neutral; clear, wavy boundary.

IIIC—55 to 72 inches, pale-brown (10YR 6/3) sand; few, medium, faint, yellowish-brown (10YR 5/4) mottles; single grain; loose; neutral.

The A horizon is dark-gray, dark grayish-brown, very dark gray, or very dark grayish-brown silty clay loam to clay. The B horizon is dark gray or gray. The IIC and IIIC horizons are gray to dark-brown loam to sand. The IIIC horizon is lacking in places. Reaction ranges from slightly acid to moderately alkaline throughout the profile.

Tunica soils are chiefly associated with Sharkey and Newellton soils. They formed in thinner beds of clayey sediments than the Sharkey soils and in thicker beds of clayey sediments than the Newellton soils.

Tunica silty clay (Tn).—This soil is at the higher elevations in slack-water areas. Individual areas range from 10 to 100 acres in size. Slope is less than 1 percent. Included in mapping were a few small areas of gently undulating soils and spots of Sharkey and Newellton soils.

This soil is suited to farming, but wetness is a severe limitation. Fieldwork is commonly delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is adequately drained and other good management is used.

The main crops are cotton and soybeans (fig. 7). Alfalfa, grain sorghum, and winter small grain also are suited. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw–1; woodland group 2w6)

Tunica silty clay, gently undulating (TnU).—This soil is in broad slack-water areas where long, narrow swales alternate with low ridges that rise 2 to 5 feet above the swales. Individual areas range from 10 to 150 acres in size. Slope is less than 3 percent. The profile of this soil is the one described as representative of the series. Included in the mapping were spots of Sharkey and Newellton soils.

This soil is suited to farming, but wetness is a severe limitation. Water accumulates in the swales, and fieldwork is delayed several days after a rain unless surface drains are installed. Clean-tilled crops that leave a large amount of residue can be safely grown year after year if this soil is drained and other good management is used.

The main crops are cotton and soybeans. Alfalfa and grain sorghum also are suited. Winter small grain can be grown where surface drainage is adequate. Suitable pasture plants are bermudagrass, tall fescue, and white clover. (Capability unit IIIw–1; woodland group 2w6)

Tunica soils, frequently flooded (Tu).—This undifferentiated group consists of level to gently undulating soils in slack-water areas. Individual areas range from about 10 to 100 acres in size. Slope is less than 3 percent. The profile of these soils is similar to the one described as representative of the series, but the surface layer ranges from silty clay loam to clay. These soils are between the Mississippi River and its levee and the White River and its levee. Generally, these soils are flooded between January and June for periods of 3 to 95 days along the Mississippi River and for periods from about 1 week to 4 months along the White River. Floods occur on an average of about once every 2 years along the Mississippi River, and about 9 years in 10 along the White River. Included in mapping were spots of Sharkey and Newellton soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used. The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw–1; woodland group 3w6)

Zachary Series

The Zachary series consists of poorly drained, level soils in drainageways on uplands. These soils formed in sediments washed from loess.

In a representative profile, the surface layer is dark grayish-brown silt loam about 5 inches thick. The subsurface layer is light brownish-gray, mottled silt loam that extends to a depth of about 26 inches. The subsoil is light olive-gray, mottled silty clay loam about 34 inches thick. The material beneath is light olive-gray, mottled silt loam that extends to a depth of 70 inches or more.

Zachary soils are moderate in natural fertility. Content of organic matter is low. Permeability is slow, and the available water capacity is high. These soils respond well

Figure 7.—**Soybeans ready for harvest on Tunica silty clay. Soybeans grow on a greater acreage than any other crop in the county.**

to fertilizer, and good tilth is easy to maintain. In places a plow pan has formed beneath the plow layer. This pan restricts root penetration and movement of water through the soil.

These soils are suited to most warm-season crops commonly grown in the county. About half of the acreage is cultivated.

Representative profile of a Zachary silt loam in an area of Zachary soils, frequently flooded, in a moist, wooded area in NW¼SW¼NW¼ sec. 22, T. 1 S., R. 1 E.:

O1—1 inch to 0, partially decomposed, matted hardwood leaves and twigs.

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; many fine roots; common worm casts; medium acid; clear, smooth boundary.

A21g—5 to 10 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 3/4) mottles; few, fine, distinct, yellowish-brown streaks along root channels; weak, fine, granular structure; friable; many fine roots; very strongly acid; clear, smooth boundary.

A22g—10 to 26 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 3/4) mottles; few, fine, distinct, yellowish-brown streaks along root channels; weak, fine, granular structure; friable; common fine roots; few pores; few, fine, black concretions; very strongly acid; abrupt, smooth boundary.

B21tg—26 to 43 inches, light olive-gray (5Y 6/2) silty clay loam; few, fine, distinct, yellowish-brown mottles; moderate, medium, prismatic structure; firm; thin patchy clay films on faces of peds; few fine roots; few pores; few, fine, black concretions; few silt streaks between prisms extend through the horizon; very strongly acid; gradual, wavy boundary.

B22tg—43 to 60 inches, light olive-gray (5Y 6/2) silty clay loam; few, fine, distinct yellowish-brown mottles; moderate, medium, subangular blocky structure; firm; thin patchy clay films on faces of peds; few black (10YR 2/1) stains on faces of some peds; few, fine, black concretions; very strongly acid; gradual, wavy boundary.

C1—60 to 70 inches, light olive-gray (5Y 6/2) silt loam; common, medium, distinct, pale-olive (5Y 6/4) mottles and few, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; common, medium and fine, black concretions; medium acid.

The A horizon ranges from 20 to 34 inches in thickness. The A1 or Ap horizon is dark grayish brown, gray, or grayish brown. The A2 horizon is gray, light gray, or light brownish gray and is mottled with brown to dark yellowish brown. The B and C horizons are gray, light brownish gray, or light olive gray. The A1 horizon is strongly acid or medium acid, the A2 and B horizons are strongly acid or very strongly acid, and the C horizon is very strongly acid to neutral.

Zachary soils are chiefly associated with Falaya and Henry soils. They have an abrupt textural change from the A horizon that is lacking in those soils. They lack the fragipan that the Henry soils have.

Zachary soils, frequently flooded (Za).—This undifferentiated group consists mainly of Zachary silt loam and as much as 20 percent soils that are similar to Zachary silt loam but have a surface layer of silty clay loam. The soils in this mapping unit are on flood plains of upland drainageways. Individual areas are as much as a few hundred acres in size. Slope is less than 1 percent. These soils are flooded for short periods, generally between January and June. Floods occur on an average of about once or twice each year. Included in mapping were spots of Falaya and Henry soils.

These soils are suited to farming, but flooding is a very severe hazard. Only warm-season annual crops that require a short growing season can be safely grown. Clean-tilled crops that leave a large amount of residue can be grown year after year if good management is used.

The main crops are soybeans and grain sorghum. Bermudagrass is a better suited pasture plant than are most other plants. (Capability unit IVw-2; woodland group 2w6)

Use and Management of the Soils

This section explains the system of capability grouping used by the Soil Conservation Service and gives predicted yields of the principal crops grown in the county under improved management. Also, it discusses the use of the soils as wildlife habitat, as woodland, for engineering works, and for town and country planning.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive land-forming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to horticultural crops or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for other specific purposes.

In the capability system, all kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. In class VIII are soils and landforms so rough, so shallow, or otherwise so limited that they do not produce worthwhile yields of crops, forage, or wood products.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c* shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example IIe-1 or IIIw-2. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

Farmers and others may find it practical to use and manage different kinds of soils in the same manner and can make good use of the capability grouping. Following is a descriptive outline of the capability grouping as it applies in Phillips County. The placement of any mapping unit in the grouping can be learned by turning to the "Guide to Mapping Units" at the back of this survey, or by referring to the notation in parentheses at the end of the description of each mapping unit in the section "Descriptions of the Soils."

Class I. Soils that have few limitations that restrict their use. (No subclasses)
- Unit I-1.—Level, well-drained, loamy soils on bottom lands.

Class II. Soils that have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion unless protected.
  - Unit IIe-1.—Gently undulating, well-drained, loamy soils on bottom lands.
  - Unit IIe-2.—Nearly level, somewhat poorly drained to well-drained, loamy soils on uplands.
- Subclass IIw. Soils moderately limited because of excess water.
  - Unit IIw-1.—Level, somewhat poorly drained and poorly drained, loamy soils on bottom lands.
  - Unit IIw-2.—Level, somewhat poorly drained, loamy soils on uplands.
  - Unit IIw-3.—Level, somewhat poorly drained, clayey soils on bottom lands.
- Subclass IIs. Soils moderately limited because of limited available water capacity.
  - Unit IIs-1.—Gently undulating, somewhat excessively drained, loamy soils on bottom lands.

Class III. Soils that have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.

Unit IIIe-1.—Gently sloping, eroded, moderately well drained and well drained, loamy soils on uplands.

Subclass IIIw. Soils severely limited for cultivation because of excess water.

Unit IIIw-1.—Level and gently undulating, poorly drained and somewhat poorly drained, clayey soils on bottom lands.

Unit IIIw-2.—Level, poorly drained, loamy soils on bottom lands.

Unit IIIw-3.—Level, poorly drained, loamy soils on uplands.

Unit IIIw-4.—Level, poorly drained, loamy soils having a high content of sodium in the lower part of the subsoil; on bottom lands and uplands.

Class IV. Soils that have very severe limitations that reduce the choice of plants, require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Unit IVe-1.—Moderately sloping, eroded, well-drained, loamy soils on uplands.

Subclass IVw. Soils very severely limited because of excess water.

Unit IVw-1.—Level and gently undulating, poorly drained and somewhat poorly drained, dominantly clayey soils on bottom lands subject to frequent flooding.

Unit IVw-2.—Level, somewhat poorly drained and poorly drained, loamy soils on bottom lands subject to frequent flooding.

Unit IVw-3.—Level and gently undulating, somewhat poorly drained and well-drained, loamy soils on bottom lands subject to frequent flooding.

Unit IVw-4.—Level and gently undulating, excessively drained, sandy soils on bottom lands subject to frequent flooding.

Subclass IVs. Soils very severely limited because of high content of sodium.

Unit IVs-1.—Level, poorly drained, loamy soils having a high content of sodium throughout the subsoil; on uplands.

Class V. Soils that are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife. (None in Phillips County.)

Class VI. Soils that have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife. (None in Phillips County.)

Class VII. Soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion unless protective cover is maintained.

Unit VIIe-1.—Moderately steep and steep, well-drained, loamy soils on uplands.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, water supply, or esthetic purposes. (None in Phillips County.)

Predicted Yields [3]

The predicated average acre yields of the principal crops shown in table 5 are based mainly on data supplied by farmers and other agricultural workers in Phillips County. These yields are not the highest that can be obtained, but they are yields received over a period of years by farmers who practice good management. They generally are obtained by (1) using the proper equipment at the right time to prepare the soil, plant crops, control weeds, and harvest crops; (2) following a systematic program for controlling insects and plant diseases; (3) choosing crop varieties that are well suited to the soil and to the types of farming operations; (4) draining wet soils; and (5) applying supplemental irrigation in dry seasons.

Use of the Soils for Wildlife [4]

Soils are related to the kinds and abundance of wildlife through the vegetation they support and the habitat the vegetation provides. Desirability of habitat depends partly on the availability of water. The kind and amount of vegetation is closely related to soil characteristics and land use.

All wildlife and fish are affected by the basic properties of soils. Among these properties are fertility, slope, wetness, and permeability. The degree of permeability determines whether or not the soil can be used to impound water in ponds and lakes.

Extensive wooded areas, such as those in the St. Francis National Forest, the White River National Wildlife Refuge, and a few areas along the Mississippi River, are well suited as habitat for deer, wild turkey, squirrel, and other woodland wildlife. These areas provide suitable food, cover, and drinking water, and wildlife is not unduly disturbed by man.

In table 6 the soils of the county are rated according to their suitability for plants, for water developments used by wildlife, and as habitat for open-land, woodland, and wetland wildlife. The ratings given in the table are well suited, suited, poorly suited, and unsuited. *Well suited* indicates that the soils are relatively free of limitations or that the limitations are easily overcome; *suited* means that the limitations need consideration but can be overcome by good management; *poorly suited* indicates that the limitations are severe and difficult to overcome; and *unsuited* indicates that use of soils for the kind of wildlife or habitat is impractical, or impossible.

The seven elements of wildlife habitat rated in table 6 are defined in the following paragraphs, and examples are given of each.

Grain and seed crops consist of domestic grain or seed-

[3] W. WILSON FERGUSON, conservation agronomist, Soil Conservation Service, helped to prepare this subsection.

[4] ROY A. GRIZZELL, JR., biologist, Soil Conservation Service, helped to prepare this subsection.

TABLE 5.—*Predicted average acre yields of principal crops*

[These yields can be obtained under improved management practices defined in the text. Absence of a figure indicates that the crop is not suited to or is not commonly grown on the soil specified]

Soil	Cotton	Soybeans	Rice	Wheat
	Lb. of lint	*Bu.*	*Bu.*	*Bu.*
Alligator clay	575	30	130	35
Alligator soils, frequently flooded		30		
Amagon silt loam	625	35	120	
Arkabutla silty clay loam	700	35		40
Arkabutla soils, frequently flooded		35		
Beulah fine sandy loam, gently undulating	575	30		45
Bonn silt loam		15		
Calhoun silt loam	500	30	120	
Calloway silt loam, 0 to 1 percent slopes	625	35	120	35
Calloway silt loam, 1 to 3 percent slopes	600	30		35
Commerce silt loam	800	40		45
Commerce soils, frequently flooded		40		
Convent silt loam	800	40		45
Crevasse soils, frequently flooded		15		
Dubbs silt loam, gently undulating	750	40		45
Dundee silt loam	750	40		45
Falaya silt loam	625	35		35
Fluvaquents, frequently flooded				
Foley silt loam	625	35	120	35
Grenada silt loam, 1 to 3 percent slopes	650	35		35
Henry silt loam	500	30	120	35
Jeanerette silt loam	750	40	120	40
Lagrange fine sandy loam	625	30		
Loring silt loam, 1 to 3 percent slopes	650	35		40
Loring silt loam, 3 to 8 percent slopes, eroded	600	25		35
Marvell fine sandy loam	650	35		35
Memphis silt loam, 1 to 3 percent slopes	700	35		40
Memphis silt loam, 3 to 8 percent slopes, eroded	625	25		35
Memphis silt loam, 8 to 12 percent slopes, eroded				30
Memphis silt loam, 12 to 40 percent slopes				
Mhoon soils, frequently flooded		30		
Natchez silt loam, 20 to 40 percent slopes				
Newellton silty clay	650	35		40
Newellton silty clay, gently undulating	650	35		40
Newellton soils, frequently flooded		35		
Robinsonville fine sandy loam	750	40		45
Robinsonville soils, frequently flooded		40		
Sharkey silty clay	575	35	130	35
Sharkey soils, frequently flooded		35		
Tunica silty clay	600	35	130	35
Tunica silty clay, gently undulating	600	35		35
Tunica soils, frequently flooded		35		
Zachary soils, frequently flooded		25		

producing annuals that produce food for wildlife. Examples are wheat, corn, sorghum, oats, millet, rice, soybeans, and sunflower.

Grasses and legumes are domestic or introduced plants that furnish food and cover for wildlife. Examples are fescue, bermudagrass, panicgrasses, bristlegrasses, clover, and alfalfa.

Wild herbaceous upland plants are native or introduced annual or perennial grasses and forbs (weeds) that provide food and cover primarily for upland wildlife. These plants are established naturally. Examples are croton, switchcane, pokeweed, tickclovers, wild beans, wild peas, partridgepeas, bluestems, indiangrass, strawberries, and wild lespedezas.

Hardwood woody plants are nonconiferous trees, shrubs, and woody vines that furnish fruits, nuts, seed, buds, twigs (browse), or foliage that are used by wildlife. Most species are established naturally, but they may also be planted. Examples of trees are oak, cherry, mulberry, dogwood, viburnum, and maple. Examples of vines and shrubs are honeysuckle, blackberry, greenbrier, wildgrape, and multiflora rose.

Wetland food and cover plants are annual and perennial, domestic or wild, herbaceous plants that grow on moist or wet sites. These plants produce the food and cover commonly used by wetland wildlife. Examples are rice, smartweeds, wild millet, rice cutgrass, cattails, naiads, pondweeds, water lilies, and sesbania.

Shallow water developments are water areas that have been made by impounding water, by digging excavations, or by using devices to control water. Examples are rice fields, flooded soybean fields, shallow dugouts, and devices that control the water level in bottom lands.

Excavated ponds are dug-out or impounded areas that hold enough water of suitable depth and quality to support fish and wildlife.

The three kinds of wildlife rated in table 6 are described in the following paragraphs, and examples of each are given.

Open-land wildlife consists of animals that normally inhabit cropland, pastures, meadows, and fields of herbaceous vegetation. They include bobwhite, doves, and cottontail rabbits.

Woodland wildlife consists of animals that normally inhabit areas of trees and shrubs. Among these are deer, raccoon, turkey, and squirrel.

Wetland wildlife consists of animals that normally inhabit wet areas, including ponds, marshes, rivers, bayous, and swamps. They include wood ducks, mallards, Canada geese, rail, heron, mink, and muskrat.

Wildlife habitat may be managed by planting choice food plants, by managing existing vegetation, and by locating water developments where water is scarce or needed. Information about soils provides a basis for improving habitat for many kinds of wildlife. The present vegetation reflects past land use. Vegetation alone therefore can be a false criterion in judging potential for developing wildlife habitat.

Information about the soils helps the landowner to determine specific sites for wildlife developments and to establish food plants and cover. This knowledge can be used as a basis for preparing maps, either of small or of large areas, that show the present and projected conditions of the habitat.

Local representatives of the Soil Conservation Service may be consulted for help in planning and establishing food supply and habitat for a specific area. For additional information on the suitability of each soil, refer to the detailed soil descriptions in the section "Descriptions of the Soils."

Use of the Soils for Woodland[5]

When the first settlers arrived in Phillips County, virgin forest covered all of the county except for river sandbars and scattered, small patches where the Indians grew such crops as corn, beans, and squash.

In the lowlands the principal tree species were sweetgum, water tupelo, baldcypress, bottom-land oaks, ash, sycamore, cottonwood, and hickory. On the uplands of Crowley Ridge and the associated lower ridges were beech, black walnut, butternut, cucumbertree, black cherry, red oak, black oak, white oak, hickory, ash, sycamore, and cottonwood.

Woodland now makes up only about 81,600 acres, or 18 percent of the land area of the county (*17*). About 8,800 acres of the woodland is in the St. Francis National Forest, and an equal amount is in the White River National Wildlife Refuge. The rest is privately owned. In recent years there has been a trend to convert several thousand acres each year from woodland to cropland. It is expected that this trend will continue, but at a gradually reduced rate. Additionally, areas of woodland are being taken up by urban expansion, chiefly in the Helena-West Helena area.

Production of wood crops

This section gives information that will help owners and managers of woodland to establish, manage, and harvest tree crops. The information is based on detailed plot studies, measurement of different trees on different soils, published and unpublished records, and the experience and judgment of technicians who work with tree crops in this area.

Management of woodland can be planned more effectively if soils are grouped according to those characteristics that affect the growth of trees and the management of stands. The soils in Phillips County have been assigned to 16 woodland suitability groups. These groups are listed in table 7. To find the woodland group to which a specific soil has been assigned, refer to the "Guide to Mapping Units" at the back of the survey, or to the notation at the end of each mapping unit description. Each group consists of soils that are about the same in suitability for wood crops, in potential productivity, and in management requirements. These factors depend on such soil characteristics as depth; arrangement of layers in the profile; texture, drainage, color, reaction, and consistence of each layer; content of humus and minerals; degree of erosion; and slope.

Each woodland group has been assigned a symbol that consists of three elements. The first element in the symbol is an Arabic numeral. It indicates the relative potential of the soils in the group for wood crops. It expresses the site quality based on one or more forest types or species. Number 1 indicates very high site index or potential productivity, followed by 2, 3, 4, and 5, the lowest potential productivity.

The second element in the symbol is a lowercase letter. It indicates the soil or physiographic characteristic that is the primary cause of the limitations. The letter "w" indicates wetness; "s" indicates sandy soils; "r" indicates a limitation resulting only from steepness of slope; "t" indicates toxic substances in the rooting zone; and the letter "o" indicates soils having no significant limitations.

The third element, an Arabic numeral, indicates the degree of limitations and the suitability of the soils for different kinds of trees. Number 4 indicates soils that have no limitations or slight limitations and that are better suited to broadleaf trees than to needleleaf trees; 5 indicates soils that have one or more moderate limitations and that are better suited to broadleaf trees than to needleleaf trees; 6 indicates soils that have one or more severe limitations and that are better suited to broadleaf trees than to needleleaf trees. The number 7 indicates soils that have no limitations or slight limitations and that are suitable for either broadleaf or needleleaf trees; 8 indicates soils that have one or more moderate limitations and that are suitable for either broadleaf or needleleaf trees; and 9 indicates soils that have one or more severe limitations and that are suitable for either broadleaf or needleleaf trees. The number 0 indicates the soils are not suitable for the production of major commercial wood crops.

The column headings in table 7 are explained in the following paragraphs.

Major hazards and limitations.—Under this heading are given the nature and degree of soil-related limitations that are concerns in woodland management.

Equipment limitations refer to soil characteristics and topographic features that restrict or prohibit the use of conventional equipment for planting, road construction, control of unwanted vegetation, harvesting tree crops, and fire control. The limitations in Phillips County are caused by wetness, texture of the surface soil, frequency and duration of flooding, and slopes. The limitation is *slight* if the slope is less than 12 percent, if the soils are loamy, if the soils are at least moderately well drained and are not subject to flooding or excessive surface water, and if the use of equipment is restricted for only a short period after a heavy rain. The limitation is *moderate* if the slope dominantly ranges from 12 to 40 percent, if the soils are not subject to periodic flooding or excessive surface water for extended periods, if the soils are sandy, and if equipment normally can be used from March to December. The limitation is *severe* if the use of equipment is limited to the driest months or to short periods between floods of long duration.

Seedling mortality refers to the expected loss of seedlings during the first two growing seasons after planting. Loss of seedlings in this county is caused mainly by excess water or droughtiness. Mortality is *slight* if less than 25 percent of planted seedlings die, if adequate natural regeneration cannot be relied upon, and if special site preparation and replanting are necessary.

Erosion hazard depends on the steepness and length of the slope and the erodibility of the soil.

Potential productivity.—The important wood crops for the soils of each group are listed under this heading. Each is rated according to its estimated site index range. Site index is the average height of the dominant trees in a stand at age 30 for cottonwood, at age 35 for sycamore, and at age 50 for other species. The higher the site index, the higher the potential productivity of the soil for wood crops.

[5] MAX D. BOLAR, woodland conservationist, Soil Conservation Service, helped to prepare this section.

TABLE 6.—*Suitability of soils for elements of*

Mapping unit and symbol	Elements of wildlife habitat			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants
Alligator clay: Ac	Suited	Suited	Suited	Well suited
Alligator soils, frequently flooded: Ag	Poorly suited	Suited	Suited	Well suited
Amagon silt loam: Am	Suited	Suited	Suited	Well suited
Arkabutla silty clay loam: Ar	Well suited	Well suited	Well suited	Well suited
Arkabutla soils, frequently flooded: As	Poorly suited	Suited	Suited	Well suited
Beulah fine sandy loam, gently undulating: BeU	Suited	Suited	Suited	Well suited
Bonn silt loam: Bo	Poorly suited to unsuited.	Poorly suited	Poorly suited	Poorly suited
Calhoun silt loam: Ca	Suited	Suited	Suited	Well suited
Calloway silt loam, 0 to 1 percent slopes: CbA	Suited	Suited	Well suited	Well suited
Calloway silt loam, 1 to 3 percent slopes: CbB	Suited	Suited	Well suited	Well suited
Commerce silt loam: Cm	Well suited	Well suited	Well suited	Well suited
Commerce soils, frequently flooded: Cn	Poorly suited	Suited	Suited	Well suited
Convent silt loam: Co	Well suited	Well suited	Well suited	Well suited
Crevasse soils, frequently flooded: Cr	Poorly suited	Poorly suited	Poorly suited	Poorly suited
Dubbs silt loam, gently undulating: DsU	Well suited	Well suited	Well suited	Well suited
Dundee silt loam: Du	Well suited	Well suited	Well suited	Well suited
Falaya silt loam: Fa	Suited	Suited	Well suited	Well suited
Fluvaquents, frequently flooded: Ff	Poorly suited	Suited	Suited	Well suited
Foley silt loam: Fo	Suited	Suited	Suited	Well suited
Grenada silt loam, 1 to 3 percent slopes: GrB	Suited	Well suited	Well suited	Well suited
Henry silt loam: He	Suited	Suited	Suited	Well suited
Jeanerette silt loam: Je	Suited	Suited	Suited	Well suited
Lagrange fine sandy loam: La	Suited	Suited	Suited	Well suited
Loring silt loam, 1 to 3 percent slopes: LoB	Suited	Well suited	Well suited	Well suited
Loring silt loam, 3 to 8 percent slopes, eroded: LoC2.	Suited	Well suited	Well suited	Well suited
Marvell fine sandy loam: Ma	Well suited	Well suited	Well suited	Well suited
Memphis silt loam, 1 to 3 percent slopes: MeB	Well suited	Well suited	Well suited	Well suited
Memphis silt loam, 3 to 8 percent slopes, eroded: MeC2.	Suited	Well suited	Well suited	Well suited
Memphis silt loam, 8 to 12 percent slopes, eroded: MeD2.	Suited	Well suited	Well suited	Well suited
Memphis silt loam, 12 to 40 percent slopes: MeE	Poorly suited to unsuited.	Suited to poorly suited.	Well suited	Well suited
Mhoon soils, frequently flooded: Mh	Poorly suited	Suited	Suited	Well suited
Natchez silt loam, 20 to 40 percent slopes: NaE	Unsuited	Poorly suited	Well suited	Well suited
Newellton silty clay: Ne	Suited	Suited	Suited	Well suited
Newellton silty clay, gently undulating: NeU	Suited	Suited	Suited	Well suited
Newellton soils, frequently flooded: Nf	Poorly suited	Suited	Suited	Well suited
Robinsonville fine sandy loam: Ro	Well suited	Well suited	Well suited	Well suited
Robinsonville soils, frequently flooded: Rs	Poorly suited	Suited	Suited	Well suited
Sharkey silty clay: Sh	Suited	Suited	Suited	Well suited
Sharkey soils, frequently flooded: Sk	Poorly suited	Suited	Suited	Well suited
Tunica silty clay: Tn	Suited	Suited	Suited	Well suited
Tunica silty clay, gently undulating: TnU	Suited	Suited	Suited	Well suited
Tunica soils, frequently flooded: Tu	Poorly suited	Suited	Suited	Well suited
Zachary soils, frequently flooded: Za	Poorly suited	Suited	Suited	Well suited

wildlife habitat and for kinds of wildlife

Elements of wildlife habitat—Continued			Kinds of wildlife		
Wetland food and cover plants	Shallow water developments	Excavated ponds	Open-land wildlife	Woodland wildlife	Wetland wildlife
Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Well suited	Well suited	Suited	Suited	Well suited	Well suited.
Suited	Suited	Suited	Well suited	Well suited	Suited.
Suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Unsuited	Unsuited	Unsuited	Suited	Well suited	Unsuited.
Poorly suited	Well suited	Well suited	Poorly suited	Poorly suited	Suited.
Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Suited	Suited	Well suited	Suited	Well suited	Suited.
Suited	Suited to poorly suited.	Well suited	Suited	Well suited	Suited.
Suited	Suited	Suited	Well suited	Well suited	Suited.
Suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Poorly suited	Suited	Suited	Well suited	Well suited	Suited.
Unsuited	Unsuited	Unsuited	Poorly suited	Poorly suited	Unsuited.
Poorly suited to unsuited.	Poorly suited to unsuited.	Suited to poorly suited.	Well suited	Well suited	Poorly suited to unsuited.
Suited	Suited	Suited	Well suited	Well suited	Suited.
Suited	Suited	Suited	Suited	Well suited	Suited.
Well suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Poorly suited	Poorly suited	Well suited	Well suited	Well suited	Poorly suited.
Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Suited	Suited	Suited	Well suited	Well suited.
Poorly suited	Poorly suited	Suited	Well suited	Well suited	Poorly suited.
Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Unsuited	Unsuited	Suited	Well suited	Well suited	Unsuited.
Unsuited	Unsuited	Poorly suited	Well suited	Well suited	Unsuited.
Unsuited	Unsuited	Poorly suited to unsuited.	Poorly suited	Well suited	Unsuited.
Well suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Unsuited	Unsuited	Unsuited	Poorly suited	Well suited	Unsuited.
Suited	Suited	Suited to poorly suited.	Suited	Well suited	Suited.
Suited	Suited	Suited to poorly suited.	Suited	Well suited	Suited.
Suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Unsuited	Unsuited	Unsuited	Well suited	Well suited	Unsuited.
Unsuited	Unsuited	Unsuited	Suited	Well suited	Unsuited.
Well suited	Well suited	Well suited	Suited	Well suited	Well suited.
Well suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Well suited	Well suited	Suited	Suited	Well suited	Well suited.
Well suited	Well suited	Suited	Suited	Well suited	Well suited.
Well suited	Poorly suited	Unsuited	Suited	Well suited	Suited.
Well suited	Poorly suited	Unsuited	Suited	Well suited	Suited.

TABLE 7.—*Woodland groups*

Woodland group, description of soils, and map symbols	Major hazards and limitations	Potential productivity
		Important wood crops
1o4: Level, well-drained, loamy soils on bottom lands; very high potential productivity; best suited to hardwoods: Ro, Rs.	No serious limitations.	Cottonwood Sweetgum Water oak
1w5: Level and gently undulating, somewhat poorly drained, loamy soils on bottom lands; very high potential productivity; best suited to hardwoods: Ar, Cm, Cn, Co.	Moderate equipment limitations and slight to moderate seedling mortality because of soil wetness.	Cottonwood Sweetgum Water oak Nuttall oak
1w6: Level, somewhat poorly drained and poorly drained, loamy soils on bottom lands, some areas subject to frequent flooding; very high potential productivity; best suited to hardwoods: Am, As, Mh.	Severe equipment limitations and moderate to severe seedling mortality because of soil wetness; flooding on most tracts.	Cottonwood Sweetgum Water oak Nuttall oak
1w8: Level, somewhat poorly drained, loamy soils on bottom lands; very high potential productivity; suited to pines or hardwoods: Fa.	Moderate equipment limitations and slight to moderate seedling mortality because of soil wetness.	Loblolly pine Sweetgum Cottonwood
2o4: Level and gently undulating, somewhat excessively drained and well-drained, loamy soils on bottom lands; high potential productivity; best suited to hardwoods: BeU, DsU, Ma.	No serious limitations.	Cottonwood Water oak Nuttall oak Willow oak Cherrybark oak Sweetgum
2w5: Level and gently undulating, somewhat poorly drained, loamy and clayey soils on bottom lands; high potential productivity; best suited to hardwoods: Du, Ne, NeU.	Moderate equipment limitations and slight to moderate seedling mortality because of soil wetness.	Cottonwood Water oak Cherrybark oak Nuttall oak Sweetgum
2w6: Level and gently undulating, poorly drained, clayey and loamy soils on bottom lands, some areas subject to frequent flooding; high potential productivity; best suited to hardwoods: Ac, Je, Sh, Tn, TnU, Za.	Severe equipment limitations and moderate seedling mortality because of soil wetness; flooding on some tracts.	Sweetgum Water oak Nuttall oak Cherrybark oak
2o7: Nearly level to moderately sloping, well-drained, loamy soils on uplands; high potential productivity; suited to pines or hardwoods: MeB, MeC2, MeD2.	No serious limitations.	Loblolly pine Cherrybark oak Sweetgum
2r8: Moderately steep and steep, well-drained, loamy soils on uplands; high potential productivity; suited to pines or hardwoods: MeE, NaE.	Moderate equipment limitations and erosion hazard because of slopes.	Loblolly pine Cherrybark oak Sweetgum
2w9: Level, poorly drained, loamy soils on bottom lands, high potential productivity; suited to pine or hardwoods: La.	Severe equipment limitations and moderate seedling mortality because of soil wetness.	Sweetgum Water oak Cottonwood
3w6: Level and gently undulating poorly drained and somewhat poorly drained, clayey soils on bottom lands, subject to frequent flooding; moderately high potential productivity; best suited to hardwoods: Ag, Sk, Nf, Tu.	Severe equipment limitations and seedling mortality because of soil wetness and frequent flooding.	Cottonwood Sycamore Shumard oak Sweetgum Water oak
3s6: Level and gently undulating, excessively drained, sandy soils on bottom lands, subject to frequent flooding; moderately high potential productivity; best suited to hardwoods: Cr.	Moderate equipment limitations and severe seedling mortality because the soil is loose, droughty, and sandy.	Cottonwood
3o7: Nearly level and gently sloping, moderately well drained, loamy soils on uplands; moderately high potential productivity; suited to pines and hardwoods: GrB, LoB, LoC2.	No serious limitations.	Loblolly pine Shortleaf pine Sweetgum
3w8: Level and nearly level, somewhat poorly drained, loamy soils on uplands; moderately high potential productivity; suited to pines and hardwoods: CbA, CbB.	Moderate equipment limitations and slight to moderate seedling mortality because of soil wetness.	Loblolly pine Sweetgum Water oak

See footnote at end of table.

and wood crops

Potential productivity—Con.	Preferred species—	
Estimated site index range [1]	In existing stands	For planting
106–115+ 96+ 96–116+	Cottonwood, sycamore, black walnut, water oak, willow oak, Nuttall oak, cherrybark oak, sweetgum, hackberry, elm, Shumard oak, swamp chestnut oak, pecan.	Black walnut, cherrybark oak, water oak, Shumard oak, swamp chestnut oak, sycamore, yellow-poplar, cottonwood, green ash, willow oak.
106–115+ 96+ 96–116 86–95	Cottonwood, sycamore, sweetgum, water oak, cherrybark oak, Nuttall oak, Shumard oak, green ash, silver maple, hackberry, elm, baldcypress.	Nuttall oak, water oak, green ash, cottonwood, sycamore, cherrybark oak, Shumard oak, sweetgum.
106–115+ 96+ 96–116 86–95	Cottonwood, sweetgum, water oak, Nuttall oak, Shumard oak, cherrybark oak, green ash, silver maple, elm, hackberry, sycamore, baldcypress.	Water oak, Nuttall oak, willow oak, Shumard oak, cherrybark oak, green ash, cottonwood, sycamore, sweetgum.
96+ 96+ 106–115	Loblolly pine, sweetgum, cottonwood, sycamore, yellow-poplar, red oak, white oak.	Loblolly pine, sweetgum, cottonwood, sycamore, yellow-poplar, cherrybark oak, Nuttall oak.
96–105 86–95 86–95 86–95 86–95 86–95	Cottonwood, water oak, Nuttall oak, willow oak, cherrybark oak, Shumard oak, swamp chestnut oak, sweetgum, black walnut, sycamore, hackberry, green ash, elm, pecan.	Black walnut, cherrybark oak, water oak, Shumard oak, swamp chestnut oak, willow oak, sweetgum, cottonwood, yellow-poplar, green ash.
96–105 86–105 86–105 86–105 86–105	Cottonwood, water oak, cherrybark oak, Nuttall oak, swamp chestnut oak, willow oak, overcup oak, sweetgum, sycamore, green ash, hackberry, elm, pecan.	Cherrybark oak, water oak, Nuttall oak, Shumard oak, swamp chestnut oak, sweetgum, cottonwood, sycamore.
86–95 86–95 86–95 76–85	Sweetgum, water oak, Nuttall oak, cherrybark oak, overcup oak, willow oak, swamp chestnut oak, green ash, elm, cottonwood, hackberry, pecan, sycamore.	Nuttall oak, cherrybark oak, water oak, swamp chestnut oak, cottonwood, green ash, sycamore, sweetgum.
86–95 86–95 86–95	Shortleaf pine, loblolly pine, black walnut, yellow-poplar, cucumbertree, white oak, cherrybark oak, Shumard oak, black oak, southern red oak, black cherry, cottonwood, sycamore.	Black walnut, loblolly pine, cherrybark oak, yellow-poplar, cottonwood, sycamore, sweetgum.
86–95 86–95 86–95	Shortleaf pine, loblolly pine, black walnut, yellow-poplar, cucumbertree, cherrybark oak, southern red oak, Shumard oak, black oak, black cherry, sycamore, cottonwood.	Black walnut, yellow-poplar, loblolly pine, sweetgum, cherrybark oak.
86–95 86–95 86–95	Sweetgum, loblolly pine, water oak, cottonwood, Shumard oak, red oak, swamp chestnut oak, sycamore.	Loblolly pine, Shumard oak, swamp chestnut oak, sweetgum, cottonwood, sycamore, water oak.
76–85 76–85 70–80 76–85 76–85	Cottonwood, sycamore, Shumard oak, sweetgum, water oak, swamp chestnut oak, overcup oak, willow oak, green ash, pecan.	Shumard oak, swamp chestnut oak, water oak, cottonwood, sweetgum, sycamore, green ash.
100–110	Cottonwood, hackberry, silver maple, pecan, sycamore	Cottonwood, sycamore.
76–85 66–75 76–85	Loblolly pine, shortleaf pine, sweetgum, red oak, white oak.	Loblolly pine, sweetgum.
76–85 76–85 76–85	Loblolly pine, shortleaf pine, sweetgum, water oak, willow oak, black oak, southern red oak, white oak.	Loblolly pine, sweetgum.

TABLE 7.—*Woodland groups*

Woodland group, description of soils, and map symbols	Major hazards and limitations	Potential productivity
		Important wood crops
3w9: Level, poorly drained, loamy soils on bottom lands and upland flats; moderately high potential productivity; suited to pines and hardwoods: Ca, Fo, He.	Severe equipment limitations and seedling mortality because of soil wetness.	Loblolly pine Sweetgum Water oak Nuttall oak Shumard oak
5t0: Level, poorly drained, loamy soils on upland flats; high content of sodium in the subsoil; unsuited to trees of commercial quality: Bo.		

[1] Site class ratings adapted from data gathered in soil-woodland site studies by the Soil Conservation Service and Forest Service (*12*,

Preferred species.—Under this heading are listed the kinds of trees to be favored for management in existing stands and the kinds to be chosen for planting in establishing or reinforcing a stand. Species were selected on the basis of their growth and of the quality, value, and marketability of the products obtained from each.

Engineering Uses of the Soils[6]

This section provides information of special interest to engineers, contractors, farmers, and others who use soil as structual material or as foundation material upon which structures are built. Information contained in this section is valuable to planning commissions, town and country planners, town and city managers, sanitarians, land developers, architects, and realtors who are concerned with soils and their limitations in land use planning and development. In this section are discussed those properties of the soils that affect construction and maintenance of roads and airports, pipelines, building foundations, water storage facilities, erosion control structures, drainage systems, and sewage disposal systems. Among the soil properties most important in engineering are permeability, shear strength, consolidation potential, shrink-swell potential, available water capacity, compactibility, and reaction. Soil characteristics that affect these properties are gradation, grain-size distribution, plasticity, and soil composition.

Information concerning these and related soil properties is furnished in tables 8, 9, and 10. The estimates and interpretations of soil properties in these tables can be used in—

1. Evaluating the potential of areas for residential, industrial, commercial, and recreational uses. Among those factors that must be considered in selecting areas are seasonal high water table, susceptibility to flooding, and permeability of the soil.
2. Evaluating potential locations for roads, highways, airports, pipelines, and underground cables. Among those factors that must be considered are depth to the water table, soil permeability, frequency of flooding, and susceptibility to sliding.
3. Locating areas that are probable sources of sand, gravel, or roadfill suitable for use as construction material. Among those factors that must be considered in selecting locations are depth to the water table, thickness of the deposits, shrink-swell potential, and moisture content.
4. Planning of drainage systems, farm ponds, irrigation systems, diversion terraces, and other structures for controlling water and conserving soil. Among those factors that must be considered are permeability and seepage rate, depth to water table, slope, available water capacity, depth to layers such as fragipans, claypans, and sand that influence the rate of water movement, and flooding.

[6] KIRK WALKER, JR., civil engineer, Soil Conservation Service, helped to prepare this section.

The engineering interpretations reported here do not eliminate the need for sampling and testing at the site of specific works. The information applies only at the depths given in table 8. The soil map is useful in planning more detailed field investigations and for indicating the soil limitations that may be expected.

Some terms used by soil scientists may be unfamiliar to engineers, and some words have different meanings in soil science than they have in engineering. Among the terms that have special meaning in soil science are sand, silt, clay, and loam. These and other terms are defined in the Glossary.

Engineering classification systems

The two systems most commonly used by engineers in classifying soils are the AASHO system (*1*), adopted by the American Association of State Highway Officials, and the Unified soil classification system (*18*), used by the Soil Conservation Service, Department of Defense, and others.

The AASHO system is used to classify soils according to those properties that affect use in highway construction. In this system a soil is placed in one of seven basic *and wood crops*—Continued

Potential productivity—Con.	Preferred species—	
Estimated site index range [1]	In existing stands	For planting
76–85 76–85 76–85 76–85 76–85	Loblolly pine, shortleaf pine, sweetgum, water oak, black oak, southern red oak, white oak.	Loblolly pine, sweetgum, water oak.

13, 15, 16).

groups ranging from A–1 through A–7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A–1 are gravelly soils of high bearing capacity, or the best soils for road subgrade. In group A–7 are clayey soils that have low bearing capacity when wet. The best soils for subgrade are therefore classified as A–1, the next best A–2, and so on to class A–7, the poorest soils for subgrade. If laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–a, A–1–b; A–2–4, A–2–5, A–2–6, A–2–7; and A–7–5, A–7–6. If soil material is near a classification boundary, it is given a symbol showing both classes; for example, A–2 or A–4. Within each group the relative engineering value of a soil material can be indicated by a group index number. There is no upper limit of group index values in AASHO Designation M 145–66 (*1*). Under average conditions of good drainage and thorough compaction, the supporting value of a material used as subgrade may be assumed to be in inverse ratio to its group index. A group index of 0 indicates a good subgrade material, and a group index of 20 or greater indicates a very poor subgrade material. The AASHO classification for tested soils, with index numbers in parentheses, is shown in table 10. The estimated classification for all soils mapped in this survey area is given in table 8.

In the Unified system, soils are classified according to particle-size distribution, plasticity, liquid limit, and organic-matter content. Soils are grouped in 15 classes. There are 8 classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; 6 classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and 1 class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, CL–CH.

Estimated engineering properties

Table 8 provides estimates of soil properties important to engineering. The estimates are based on field classification and descriptions, physical and chemical tests of selected representative samples, test data from comparable soils in adjacent areas, and from detailed experience in working with the individual kinds of soil in the survey area. Bedrock is many feet below the surface and generally is not a factor in planning construction.

USDA texture is determined by the relative proportions of sand, silt, and clay in soil material that is less than 2.0 millimeters in diameter. "Sand," "silt," and "clay," and some of the other terms used in the USDA textural classification are defined in the Glossary.

Liquid limit and plasticity index are defined in the subsection "Engineering Test Data."

Permeability, as used in table 8, relates only to movement of water downward through undisturbed and uncompacted soil. It does not include lateral seepage. The estimates are based on soil characteristics that influence porosity of the soil. Plowpans, crusts on the surface, and other properties resulting from use of the soils are not considered. This rating should not be confused with the coefficient "K" used by engineers.

Available water capacity is the capacity of soils to store water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Reaction is the degree of acidity or alkalinity of a soil, expressed as a pH value. The pH value and relative terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential indicates how much the volume of the soil material changes as moisture content changes. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A high shrink-swell potential indicates hazards to the maintenance of structures constructed in, on, or with such materials.

Corrosivity indicates the potential danger to uncoated steel or concrete structures through chemical action that dissolves or weakens the structural material. Structural materials may corrode when buried in soil, and a given material corrodes more rapidly in some kinds of soil than in others. Extensive installations that intersect soil boundaries or soil horizons are more likely to be damaged by corrosion than are installations entirely in one kind of soil horizon.

TABLE 8.—*Estimated soil properties*

[The symbol < means less than;

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification			Percentage less than 3 inches passing sieve[1]—		
			USDA texture	Unified	AASHO	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
	Feet	*Inches*						
Alligator: Ac, Ag	0–½	0–6	Clay to silty clay loam.	CH	A–7	100	95–100	90–100
		6–44	Clay	CH	A–7	100	95–100	95–100
		44–78	Clay	CH	A–7	100	95–100	95–100
Amagon: Am	0–½	0–12	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		12–32	Silty clay loam	CL or CH	A–6 or A–7	100	95–100	95–100
		32–72	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
Arkabutla: Ar, As	½–1	0–12	Silt loam or silty clay loam.	ML, CL, or CH	A–4, A–6, or A–7	100	95–100	90–100
		12–29	Silty clay loam	CL or CH	A–6 or A–7	100	95–100	95–100
		29–57	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		57–67	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		67–82	Loamy fine sand	SM	A–2	100	75–95	15–35
Beulah: BeU	>6	0–36	Fine sandy loam	SM	A–2 or A–4	100	85–100	25–45
		36–72	Loamy fine sand and loamy sand.	SM	A–2	100	65–95	15–35
Bonn: Bo	0–½	0–7	Silt loam	ML or CL	A–4	100	95–100	95–100
		7–23	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		23–35	Silty clay loam	CL or CH	A–7	100	95–100	95–100
		35–51	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		51–81	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
Calhoun: Ca	0–½	0–17	Silt loam	ML or CL	A–4	100	95–100	90–100
		17–27	Silty clay loam	CL	A–6 or A–7	100	95–100	95–100
		27–40	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		40–52	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		52–80	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
Calloway: CbA, CbB	½–1	0–7	Silt loam	ML or CL	A–4	[4] 98–100	90–100	90–100
		7–27	Silt loam	ML or CL	A–4 or A–6	[4] 98–100	95–100	95–100
		27–54	Silt loam (fragipan)	ML or CL	A–4, A–6, or A–7	[4] 98–100	95–100	90–100
		54–72	Silt loam	ML or CL	A–4, A–6, or A–7	[4] 98–100	95–100	95–100
Commerce: Cm, Cn	½–1	0–5	Fine sandy loam to silty clay loam.	SM, ML, or CL	A–4 or A–6	100	70–100	45–100
		5–13	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		13–18	Silty clay loam	CL	A–6 or A–7	100	95–100	90–100
		18–22	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		22–31	Fine sandy loam	SM or ML	A–4	100	70–85	40–60
		31–51	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		51–72	Silty clay loam	CL	A–6 or A–7	100	95–100	90–100
Convent: Co	½–1	0–73	Silt loam	ML	A–4	100	95–100	95–100
Crevasse: Cr	>6	0–72	Fine sand to loamy fine sand.	SM or SP-SM	A–2 or A–3	100	65–95	5–30
Dubbs: DsU	3–5	0–9	Silt loam	ML or CL	A–4	100	95–100	90–100
		9–28	Silty clay loam	CL	A–6	100	95–100	90–100
		28–40	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		40–55	Very fine sandy loam.	ML	A–4	100	95–100	85–95
		55–72	Fine sandy loam	SM or ML	A–4	100	70–85	40–60
Dundee: Du	½–1	0–7	Silt loam	ML or CL	A–4	100	95–100	90–100
		7–19	Silty clay loam	CL	A–6 or A–7	100	95–100	90–100
		19–48	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		48–56	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		56–72	Silty clay loam	CL	A–6 or A–7	100	95–100	90–100

See footnotes at end of table.

significant in engineering

the symbol > means greater than]

Liquid limit	Plasticity index	Permeability [2]	Available water capacity	Reaction	Shrink-swell potential	Corrosivity	
						Uncoated steel	Concrete
		Inches per hour	*Inches per inch of soil*	*pH*			
55–65	35–45	0. 06–0. 2	0. 18–0. 22	5. 1–6. 0	High	High	Moderate.
55–70	40–60	<0. 06	0. 18–0. 20	4. 5–5. 5	High	High	Moderate to high.
55–70	40–60	<0. 06	0. 18–0. 20	4. 5–8. 4	High	High	High to low.
30–45	8–15	0. 2–0. 6	0. 21–0. 23	4. 5–6. 0	Low	High	Moderate to high.
40–60	30–40	0. 06–0. 2	0. 20–0. 22	4. 5–6. 0	Moderate	High	Moderate to high.
30–45	8–15	0. 2–0. 6	0. 21–0. 23	4. 5–6. 0	Low	High	Moderate to high.
<55	[3] NP–30	0. 2–2. 0	0. 20–0. 23	4. 5–6. 5	Low to moderate	High	High to low.
30–55	25–35	0. 2–0. 6	0. 20–0. 22	4. 5–5. 5	Moderate	High	Moderate to high.
30–40	8–15	0. 6–2. 0	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
30–40	8–15	0. 6–2. 0	0. 21–0. 23	4. 5–7. 3	Low	High	High to low.
-----	NP	2. 0–6. 0	0. 05–0. 10	4. 5–7. 3	Low	High	High to low.
-----	NP	2. 0–6. 0	0. 13–0. 16	4. 5–6. 0	Low	Low	Moderate to high.
-----	NP	>6. 0	0. 05–0. 10	5. 6–7. 8	Low	Low	Moderate to low.
<25	NP–10	0. 2–0. 6	0. 19–0. 23	4. 5–7. 3	Low	High	High to low.
30–40	10–25	0. 06–0. 2	0. 10–0. 14	6. 6–8. 4	Low	High	Low.
45–60	32–40	<0. 06	0. 10–0. 14	6. 6–8. 4	Low to moderate	High	Low.
30–40	10–25	<0. 06	0. 10–0. 14	6. 6–8. 4	Low	High	Low.
30–40	10–25	<0. 06	0. 10–0. 14	7. 9–9. 1	Low	High	Low.
30	NP–10	0. 2–0. 6	0. 21–0. 23	5. 1–6. 5	Low	High	Moderate to low.
30–45	20–30	0. 06–0. 2	0. 20–0. 22	4. 5–5. 5	Low to moderate	High	Moderate to high.
30–40	8–25	0. 06–0. 2	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
30–40	8–25	0. 2–0. 6	0. 21–0. 23	4. 5–6. 5	Low	High	High to low.
30–40	8–25	0. 2–0. 6	0. 21–0. 23	5. 6–7. 8	Low	High	Moderate to low.
<30	NP–10	0. 2–0. 6	0. 21–0. 23	5. 1–6. 5	Low	High	Moderate to low.
<40	NP–20	0. 2–0. 6	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
30–45	8–25	0. 06–0. 2	0. 14–0. 16	4. 5–5. 5	Low	High	Moderate to high.
30–45	8–25	0. 2–0. 6	0. 21–0. 23	5. 1–7. 3	Low	High	Moderate to low.
<40	NP–20	0. 2–2. 0	0. 14–0. 23	6. 1–7. 8	Low to moderate	High	Low.
15–35	8–15	0. 6–2. 0	0. 21–0. 23	6. 6–8. 4	Low	High	Low.
30–45	12–20	0. 2–0. 6	0. 20–0. 22	6. 6–8. 4	Moderate	High	Low.
15–35	8–15	0. 6–2. 0	0. 21–0. 23	6. 6–8. 4	Low	High	Low.
<35	NP–10	0. 6–2. 0	0. 14–0. 16	6. 6–8. 4	Low	High	Low.
15–35	8–15	0. 6–2. 0	0. 21–0. 23	6. 6–8. 4	Low	High	Low.
30–45	12–20	0. 2–0. 6	0. 20–0. 22	6. 6–8. 4	Moderate	High	Low.
-----	NP	0. 6–2. 0	0. 21–0. 23	6. 6–8. 4	Low	High	Low.
-----	NP	>6. 0	0. 04–0. 10	6. 1–8. 4	Low	Low	Low.
<40	NP–10	0. 6–2. 0	0. 21–0. 23	5. 1–7. 3	Low	Low	Moderate to low.
30–40	15–35	0. 6–2. 0	0. 20–0. 22	4. 5–5. 5	Moderate	Moderate	Moderate to high.
30–40	8–15	0. 6–2. 0	0. 21–0. 23	4. 5–5. 5	Low	Low	Moderate to high.
-----	NP	0. 6–2. 0	0. 16–0. 18	4. 5–5. 5	Low	Low	Moderate to high.
-----	NP	0. 6–2. 0	0. 14–0. 16	4. 5–5. 5	Low	Low	Moderate to high.
10–30	NP–10	0. 6–2. 0	0. 21–0. 23	5. 1–6. 0	Low	High	Moderate.
30–45	25–35	0. 2–0. 6	0. 20–0. 22	4. 5–5. 5	Moderate	High	Moderate to high.
30–40	8–15	0. 2–0. 6	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
30–40	8–15	0. 2–0. 6	0. 21–0. 23	4. 5–6. 5	Low	High	Low to high.
30–45	25–35	0. 2–0. 6	0. 20–0. 22	4. 5–6. 5	Moderate	High	Low to high.

TABLE 8.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification			Percentage less than 3 inches passing sieve[1]—		
			USDA texture	Unified	AASHO	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
	Feet	*Inches*						
Falaya: Fa	½–1	0–44	Silt loam	ML	A–4	100	95–100	95–100
		44–73	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
Fluvaquents, frequently flooded: Ff. No valid estimate can be made except by onsite inspection and testing.								
Foley: Fo	0–½	0–12	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		12–29	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		29–60	Silty clay loam	CL or CH	A–6 or A–7	100	95–100	95–100
Grenada: GrB	2–3	0–7	Silt loam	ML or CL	A–4	100	95–100	95–100
		7–28	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		28–34	Silty clay loam (fragipan).	CL	A–6 or A–7	100	95–100	95–100
		34–45	Silty clay loam (fragipan).	CL	A–6 or A–7	100	95–100	95–100
		45–72	Silt loam (fragipan)	ML or CL	A–4 or A–6	100	95–100	95–100
Henry: He	0–½	0–5	Silt loam	ML or CL	A–4	100	95–100	95–100
		5–25	Silt loam	ML or CL	A–4	100	95–100	95–100
		25–49	Silty clay loam (fragipan).	CL	A–6 or A–7	100	95–100	95–100
		49–60	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		60–74	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
Jeanerette: Je	0–½	0–16	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
		16–43	Silty clay loam	CL or CH	A–6 or A–7	100	95–100	90–100
		43–60	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100
Lagrange: La	0–½	0–6	Fine sandy loam	SM or ML	A–4	100	80–90	36–55
		6–33	Fine sandy loam	SM	A–2 or A–4	100	80–90	30–45
		33–72	Silt loam	ML or CL	A–4 or A–6	100	90–100	85–95
Loring: LoB, LoC2	2–3	0–5	Silt loam	ML or CL	A–4	----	100	95–100
		5–9	Silt loam	ML or CL	A–4 or A–6	----	100	95–100
		9–26	Silty clay loam	CL	A–6 or A–7	----	100	95–100
		26–52	Silt loam (fragipan)	ML or CL	A–4 or A–6	----	100	95–100
		52–72	Silt loam	ML or CL	A–4 or A–6	----	100	95–100
Marvell: Ma	3–4	0–36	Fine sandy loam	SM or ML	A–4	100	80–95	36–60
		36–65	Silt loam	ML or CL	A–4 or A–6	100	90–100	90–100
Memphis: MeB, MeC2, MeD2, MeE.	>6	0–5	Silt loam	ML or CL	A–4	----	100	95–100
		5–9	Silt loam	ML or CL	A–4 or A–6	----	100	95–100
		9–43	Silty clay loam	ML or CL	A–6 or A–7	----	100	95–100
		43–55	Silt loam	ML or CL	A–4 or A–6	----	100	95–100
		55–67	Loam	ML or CL	A–4 or A–6	100	80–100	60–100
		67–80	Sandy loam	SM	A–2 or A–4	100	60–70	30–40
Mhoon: Mh	0–½	0–5	Silt loam to silty clay loam.	ML or CL	A–4, A–6, or A–7	100	95–100	95–100
		5–11	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		11–26	Silty clay loam	CL	A–6 or A–7	100	95–100	95–100
		26–42	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
		42–61	Silty clay loam	CL	A–6 or A–7	100	95–100	95–100
		61–82	Silt loam	ML or CL	A–4 or A–6	100	95–100	95–100
Natchez: NaE	>6	0–11	Silt loam	ML	A–4	100	95–100	95–100
		11–33	Silt loam	ML	A–4	100	95–100	95–100
		33–72	Silt loam	ML	A–4	100	95–100	95–100

See footnotes at end of table.

significant in engineering—Continued

Liquid limit	Plasticity index	Permeability [2]	Available water capacity	Reaction	Shrink-swell potential	Corrosivity: Uncoated steel	Corrosivity: Concrete
		Inches per hour	*Inches per inch of soil*	*pH*			
----------	NP	0. 6–2. 0	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
30–40	8–15	0. 2–0. 6	0. 21–0. 23	5. 1–7. 3	Low	High	Moderate to low.
30–40	8–20	0. –6–2. 0	0. 21–0. 23	4. 5–6. 5	Low	High	High to low.
30–40	8–20	0. 2–0. 6	0. 18–0. 20	4. 5–7. 3	Low	High	High to low.
35–55	30–45	0. 06–0. 2	0. 12–0. 15	6. 6–9. 0	Moderate	High	Low.
<35	NP–10	0. 2–0. 6	0. 21–0. 23	4. 5–6. 5	Low	Moderate	High to low.
<40	NP–20	0. 2–0. 6	0. 21–0. 23	4. 5–5. 5	Low	Moderate	Moderate to high.
30–45	20–30	0. 06–0. 2	0. 14–0. 16	4. 5–5. 5	Low	Moderate	Moderate to high.
30–45	20–30	0. 06–0. 2	0. 14–0. 16	4. 5–6. 0	Low	Moderate	Moderate to high.
30–40	8–25	0. 06–0. 2	0. 14–0. 16	4. 5–7. 3	Low	Moderate	High to low.
<30	NP–10	0. 6–2. 0	0. 21–0. 23	4. 5–6. 5	Low	High	High to low.
<30	NP–10	0. 2–0. 6	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
30–45	20–30	0. 06–0. 2	0. 14–0. 16	4. 5–5. 5	Low	High	Moderate to high.
30–40	8–25	0. 2–0. 6	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
30–40	8–25	0. 2–0. 6	0. 21–0. 23	4. 5–7. 8	Low	High	High to low.
15–35	8–15	0. 6–2. 0	0. 21–0. 23	5. 6–7. 3	Low	High	Moderate to low.
35–55	25–35	0. 2–0. 6	0. 20–0. 22	6. 6–8. 4	Moderate	High	Low.
15–35	8–15	0. 2–0. 6	0. 21–0. 23	6. 6–8. 4	Low	High	Low.
----------	NP	0. 6–2. 0	0. 14–0. 16	4. 5–6. 5	Low	High	High to low.
----------	NP	0. 6–2. 0	0. 14–0. 16	4. 5–5. 5	Low	High	Moderate to high.
<40	NP–20	0. 2–0. 6	0. 21–0. 23	4. 5–5. 5	Low	High	Moderate to high.
<35	NP–10	0. 6–2. 0	0. 21–0. 23	5. 1–6. 5	Low	Low	Moderate to low.
<40	NP–20	0. 6–2. 0	0. 21–0. 23	4. 5–5. 5	Low	Low	Moderate to high.
30–45	15–30	0. 2–0. 6	0. 20–0. 22	4. 5–5. 5	Low	Moderate	Moderate to high.
30–40	8–25	0. 2–0. 6	0. 14–0. 16	4. 5–5. 5	Low	Moderate	Moderate to high.
30–40	8–25	0. 2–0. 6	0. 21–0. 23	4. 5–5. 5	Low	Moderate	Moderate to high.
----------	NP	0. 6–2. 0	0. 14–0. 16	5. 1–6. 0	Low	Low	Moderate.
<40	NP–20	0. 2–0. 6	0. 21–0. 23	5. 1–6. 0	Low	Low	Moderate.
<35	NP–10	0. 6–2. 0	0. 21–0. 23	5. 1–6. 5	Low	Low	Moderate to low.
<40	NP–20	0. 6–2. 0	0. 21–0. [illegible]	4. 5–5. 5	Low	Low	Moderate to high.
30–45	10–30	0. 6–2. 0	0. 20–0. 22	4. 5–5. 5	Low	Low	Moderate to high.
<40	NP–20	0. 6–2. 0	0. 21–0. 23	4. 5–5. 5	Low	Low	Moderate to high.
10–40	8–20	0. 6–2. 0	0. 15–0. [illegible]	4. 5–6. 0	Low	Low	Moderate to high.
<35	NP–10	0. 6–2. 0	0. 12–0. 15	4. 5–6. 0	Low	Low	Moderate to high.
15–45	8–20	0. 2–0. 6	0. 20–0. 23	6. 1–7. 3	Low to moderate	High	Low.
15–35	8–15	0. 2–0. 6	0. 21–0. 23	6. 1–7. 8	Low	High	Low.
30–45	20–35	0. 06–0. 2	0. 20–0. 22	6. 1–7. 8	Low to moderate	High	Low.
15–35	8–15	0. 2–0. 6	0. 21–0. 23	6. 1–7. 8	Low	High	Low.
30–45	20–35	0. 06–0. 2	0. 20–0. 22	6. 6–8. 4	Low to moderate	High	Low.
15–35	8–15	0. 2–0. 6	0. 21–0. 23	6. 6–8. 4	Low	High	Low.
----------	NP	2. 0–6. 0	0. 21–0. 23	6. 1–7. 8	Low	Low	Low.
----------	NP	2. 0–6. 0	0. 21–0. 23	6. 6–8. 4	Low	Low	Low.
----------	NP	2. 0–6. 0	0. 21–0. 23	7. 4–8. 4	Low	Low	Low.

TABLE 8.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification			Percentage less than 3 inches passing sieve [1]—		
			USDA texture	Unified	AASHO	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)
	Feet	*Inches*						
Newellton: Ne, NeU, Nf	½–1	0–4	Silty clay loam to clay.	CH	A–7	100	95–100	95–100
		4–15	Silty clay	CH	A–7	100	95–100	95–100
		15–22	Silt loam	ML or CL	A–4 or A–6	100	95–100	75–95
		22–39	Fine sandy loam	ML	A–4	100	85–100	65–80
		39–72	Loamy fine sand	SM or ML	A–4	100	80–100	40–55
Robinsonville: Ro, Rs	>6	0–7	Very fine sandy loam to loamy fine sand.	SM or ML	A–2 or A–4	100	75–100	15–65
		7–22	Very fine sandy loam.	ML	A–4	100	95–100	85–95
		22–29	Loamy fine sand	SM	A–2	100	75–95	15–35
		29–33	Fine sandy loam	SM or ML	A–4	100	80–95	40–60
		33–63	Loamy fine sand and loamy very fine sand.	SM	A–2	100	75–95	15–35
		63–72	Fine sandy loam	SM or ML	A–4	100	80–95	40–60
Sharkey: Sh, Sk	0–½	0–5	Silty clay loam to clay.	CH	A–7	100	95–100	95–100
		5–72	Clay	CH	A–7		100	95–100
Tunica: Tn, TnU, Tu	0–½	0–5	Silty clay loam to clay.	CH	A–7	100	95–100	95–100
		5–27	Silty clay	CH	A–7		100	95–100
		27–36	Fine sandy loam	SM or ML	A–2 or A–4	100	80–95	30–60
		36–55	Loam	ML	A–4	100	85–100	55–80
		55–72	Sand	SM or SP–SM	A–2 or A–3	100	75–90	5–25
Zachary: Za	0–½	0–5	Silt loam	ML or CL	A–4	100	95–100	90–100
		5–26	Silt loam	ML or CL	A–4	100	95–100	90–100
		26–60	Silty clay loam	CL	A–6 or A–7	100	95–100	95–100
		60–70	Silt loam	ML or CL	A–4 or A–6	100	95–100	90–100

[1] 100 percent passed the 3-inch sieve.
[2] These values should not be confused with the coefficient "K" used by engineers.

significant in engineering—Continued

Liquid limit	Plasticity index	Permeability [2]	Available water capacity	Reaction	Shrink-swell potential	Corrosivity: Uncoated steel	Corrosivity: Concrete
		Inches per hour	*Inches per inch of soil*	*pH*			
55-65	35-45	0. 06-0. 6	0. 18-0. 23	6. 1-7. 8	High	High	Low.
55-65	35-45	0. 06-0. 2	0. 18-0. 20	6. 1-7. 8	High	High	Low.
15-35	8-15	0. 2-0. 6	0. 21-0. 23	6. 6-8. 4	Low	High	Low.
<35	NP-10	0. 6-2. 0	0. 14-0. 16	6. 6-8. 4	Low	High	Low.
----------	NP	2. 0-6. 0	0. 05-0. 10	6. 6-8. 4	Low	High	Low.
----------	NP	2. 0-6. 0	0. 05-0. 16	6. 1-8. 4	Low	Low	Low.
----------	NP	2. 0-6. 0	0. 16-0. 18	6. 1-8. 4	Low	Low	Low.
----------	NP	2. 0-6. 0	0. 05-0. 10	6. 1-8. 4	Low	Low	Low.
----------	NP	2. 0-6. 0	0. 14-0. 16	6. 1-8. 4	Low	Low	Low.
----------	NP	2. 0-6. 0	0. 05-0. 10	6. 1-8. 4	Low	Low	Low.
----------	NP	2. 0-6. 0	0. 14-0. 16	6. 1-8. 4	Low	Low	Low.
55-65	35-45	0. 06-0. 2	0. 18-0. 22	6. 1-8. 4	High	High	Low.
55-70	40-60	<0. 06	0. 18-0. 20	6. 1-8. 4	High	High	Low.
55-65	35-45	0. 06-0. 2	0. 18-0. 22	6. 1-8. 4	High	High	Low.
55-65	35-45	<0. 06	0. 18-0. 20	6. 1-8. 4	High	High	Low.
<35	NP-10	0. 6-2. 0	0. 14-0. 16	6. 1-8. 4	Low	High	Low.
<35	NP-10	0. 6-2. 0	0. 16-0. 18	6. 1-8. 4	Low	High	Low.
----------	NP	>6. 0	0. 02-0. 05	6. 1-8. 4	Low	High	Low.
<30	NP-10	0. 6-2. 0	0. 21-0. 23	5. 1-6. 0	Low	High	Moderate.
<30	NP-10	0. 2-0. 6	0. 21-0. 23	4. 5-5. 5	Low	High	Moderate to high.
30-45	20-30	0. 06-0. 2	0. 20-0. 22	4. 5-5. 5	Low to moderate	High	Moderate to high.
30-40	8-25	0. 2-0. 6	0. 21-0. 23	4. 5-7. 3	Low	High	Low to high.

[3] NP=Nonplastic.
[4] 100 percent passed the No. 4 sieve.

TABLE 9.—*Interpretations of*

Soil series and map symbols	Suitability as a source of—		
	Topsoil	Road fill	Sand
Alligator: Ac, Ag	Poor: poorly drained; seasonal high water table; plastic, clayey material.	Poor: poorly drained; low traffic-supporting capacity; high shrink-swell potential.	Unsuitable: no sand
Amagon: Am	Poor: poorly drained; seasonal high water table.	Poor: poorly drained; low traffic-supporting capacity.	Unsuitable: no sand
Arkabutla: Ar, As	Fair: seasonal high water table; moderately plastic; somewhat difficult to work.	Fair: moderate to low traffic-supporting capacity; somewhat poorly drained.	Unsuitable to a depth of 67 inches, poor below; excessive fines.
Beulah: BeU	Good	Fair to good: good below a depth of 36 inches.	Poor: excessive fines
Bonn: Bo	Poor: high sodium content within a few inches of surface.	Poor: low traffic-supporting capacity; high sodium content; dispersed and difficult to stabilize.	Unsuitable: no sand
Calhoun: Ca	Poor: poorly drained	Poor: poorly drained; moderate to low traffic-supporting capacity.	Unsuitable: no sand
Calloway: CbA, CbB	Good to fair: material below a depth of 27 inches difficult to reclaim; seasonal high water table.	Fair: somewhat poorly drained; moderate traffic-supporting capacity.	Unsuitable: no sand
Commerce: Cm, Cn	Good to fair: silty clay loam material somewhat difficult to work; seasonal high water table.	Fair to poor: somewhat poorly drained; low to moderate shrink-swell potential; moderate to low traffic-supporting capacity.	Unsuitable: no sand
Convent: Co	Good	Fair: moderate traffic-supporting capacity.	Unsuitable: no sand

engineering properties of the soils

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Land leveling
Soil features generally favorable; seasonal high water table; Ag subject to frequent flooding.	Poor to fair stability and compaction characteristics; high compressibility; high shrink-swell potential; plastic, clayey material.	Poorly drained; seasonal high water table; very slow permeability; surface ponding; Ag subject to frequent flooding.	Rapid intake rate when soil is dry and cracked, very slow intake rate otherwise; high available water capacity; Ag subject to frequent flooding.	Shallow depressions in surface; difficult to grade in wet seasons; poorly drained; seasonal high water table; Ag subject to frequent flooding.
Soil features generally favorable; seasonal high water table.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Poorly drained; seasonal high water table; slow permeability; surface ponding.	Slow intake rate; high available water capacity.	Shallow depressions in surface; difficult to grade in wet seasons; poorly drained; seasonal high water table.
Moderately slow permeability; high seepage rate below a depth of 67 inches; As subject to frequent flooding.	Poor to fair stability and compaction characteristics; medium to high compressibility.	Somewhat poorly drained; seasonal high water table; moderately slow permeability; surface ponding; As subject to frequent flooding.	Moderate to slow intake rate; high available water capacity; As subject to frequent flooding.	Shallow depressions in surface; difficult to grade in wet seasons; somewhat poorly drained; seasonal high water table; As subject to frequent flooding.
Moderately rapid permeability.	Fair compaction characteristics; moderate permeability when compacted; poor resistance to piping and erosion.	Somewhat excessively drained soil.	Moderate to rapid intake rate; moderate to low available water capacity; irregular surface.	Limited depth of cuts; sandy material below depth of 36 inches.
Soil features generally favorable; seasonal high water table.	Fair to poor stability and compaction characteristics; medium to high compressibility; difficult to vegetate; material is dispersed and is highly erodible.	Poorly drained; very slow permeability; seasonal high water table; drainage generally not feasible.	Very slow intake rate; low available water capacity; irrigation generally not feasible.	High sodium content within a few inches of surface; land grading generally not feasible.
Soil features generally favorable; seasonal high water table.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair to poor resistance to piping and erosion.	Poorly drained; seasonal high water table; slow permeability; surface ponding; ditchbanks difficult to stabilize.	Slow intake rate; high available water capacity.	Shallow depressions in surface; difficult to grade in wet seasons; poorly drained; seasonal high water table.
Soil features generally favorable; seasonal high water table.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair to poor resistance to piping and erosion.	Somewhat poorly drained; seasonal high water table; slow permeability; ditchbanks difficult to stabilize; practice not applicable on CbB.	Slow intake rate; moderate available water capacity; water control difficult on CbB because of slopes.	Somewhat poorly drained; seasonal high water table; fragipan limits depth of cut.
Moderately slow permeability; seasonal high water table; Cn subject to frequent flooding.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair to poor resistance to piping and erosion.	Somewhat poorly drained; seasonal high water table; surface ponding; Cn subject to frequent flooding.	Moderate to slow intake rate; high available water capacity; Cn subject to frequent flooding.	Shallow depressions in surface; some areas difficult to grade in wet seasons; somewhat poorly drained; seasonal high water table; Cn subject to frequent flooding.
Moderate permeability; seasonal high water table.	Poor stability and compaction characteristics; medium compressibility; poor resistance to piping and erosion.	Somewhat poorly drained; seasonal high water table; ditchbanks difficult to stabilize.	Moderate intake rate; high available water capacity.	Shallow depressions in surface; somewhat poorly drained; seasonal high water table.

TABLE 9.—*Interpretations of engineering*

Soil series and map symbols	Suitability as a source of—		
	Topsoil	Road fill	Sand
Crevasse: Cr	Poor: sandy material	Good	Poor to fair: some layers have excessive fines.
Dubbs: DsU	Good to a depth of 9 inches; fair between depths of 9 and 28 inches; good below a depth of 28 inches.	Fair: moderate traffic-supporting capacity.	Unsuitable: generally no sand
Dundee: Du	Fair: somewhat difficult to work between depths of 7 and 19 inches.	Fair: moderate traffic-supporting capacity; somewhat poorly drained.	Unsuitable: no sand
Falaya: Fa	Good	Fair: moderate traffic-supporting capacity; somewhat poorly drained.	Unsuitable: no sand
Fluvaquents, frequently flooded: Ff. No valid interpretations can be made except by onsite inspection.			
Foley: Fo	Poor: poorly drained; high sodium content in subsoil; difficult to reclaim.	Poor: poorly drained; moderate to low traffic-supporting capacity; high sodium content in subsoil; difficult or impossible to reclaim.	Unsuitable: no sand
Grenada: GrB	Fair: fragipan at a depth of 28 inches, difficult to reclaim.	Fair: moderate traffic-supporting capacity.	Unsuitable: no sand
Henry: He	Poor: poorly drained	Poor: poorly drained; moderate to low traffic-supporting capacity.	Unsuitable: no sand
Jeanerette: Je	Poor: poorly drained	Poor: poorly drained; moderate to low traffic-supporting capacity.	Unsuitable: no sand

properties of the soils—Continued

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Land leveling
Rapid permeability; subject to frequent flooding.	Moderate to high permeability after compaction; poor resistance to piping and erosion.	Excessively drained soil	Rapid intake rate; low available water capacity; irregular surface; subject to frequent flooding.	Subject to frequent flooding; soil poorly suited to crops; land grading generally not feasible.
Moderate permeability	Fair to poor stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Well-drained soil	Moderate intake rate; high available water capacity; irregular surface.	Soil features generally favorable.
Moderately slow permeability; seasonal high water table.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Somewhat poorly drained; seasonal high water table; moderately slow permeability; surface ponding.	Slow intake rate; high available water capacity.	Shallow depressions in surface; somewhat poorly drained; seasonal high water table; somewhat difficult to grade in wet season.
Moderately slow permeability; seasonal high water table.	Poor to fair stability and compaction characteristics; medium to high compressibility; poor to fair resistance to piping when well mixed.	Somewhat poorly drained; seasonal high water table; moderately slow permeability; surface ponding.	Slow intake rate; high available water capacity.	Shallow depressions in surface; somewhat poorly drained; seasonal high water table; surface ponding.
Soil features generally favorable; seasonal high water table.	Fair to poor stability and compaction characteristics; medium to high compressibility; subsoil on embankments difficult to vegetate; material is dispersed and is highly erodible.	Poorly drained; seasonal high water table; slow permeability; surface ponding; ditchbanks difficult to stabilize.	Slow intake rate; moderate available water capacity.	Shallow depressions in surface; difficult to grade in wet seasons; poorly drained; seasonal high water table; high sodium content in middle part of subsoil limits practical depth of cut.
Soil features generally favorable.	Fair to poor stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Moderately well drained soil.	Slow intake rate; moderate available water capacity; water control difficult because of slopes.	Fragipan limits depth of cut.
Soil features generally favorable; seasonal high water table.	Poor to fair stability and compaction characteristics; medium to high compressibility; poor to fair resistance to piping when well mixed.	Poorly drained; seasonal high water table; slow permeability; surface ponding; ditchbanks difficult to stabilize.	Slow intake rate; moderate available water capacity.	Shallow depressions in surface; poorly drained; seasonal high water table.
Moderately slow permeability; seasonal high water table.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Poorly drained; seasonal high water table; moderately slow permeability; surface ponding.	Slow intake rate; high available water capacity.	Shallow depressions in surface; poorly drained; seasonal high water table; somewhat difficult to grade in wet seasons.

TABLE 9.—*Interpretations of engineering*

Soil series and map symbols	Suitability as a source of—		
	Topsoil	Road fill	Sand
Lagrange: La	Poor: poorly drained	Poor: poorly drained; moderate traffic-supporting capacity.	Unsuitable to poor in upper 33 inches; excessive fines; unsuitable below, no sand.
Loring: LoB, LoC2	Fair: somewhat difficult to work; material below a depth of 26 inches difficult to reclaim.	Fair to poor: moderate to low traffic-supporting capacity.	Unsuitable: no sand
Marvell: Ma	Good	Fair: moderate traffic-supporting capacity.	Unsuitable to poor in upper 36 inches; excessive fines; unsuitable below, no sand.
Memphis: MeB, MeC2, MeD2, MeE.	Generally good; fair where slopes are 8 to 15 percent; poor where slopes are more than 15 percent.	Fair to poor: moderate to low traffic-supporting capacity; slope.	Unsuitable: generally no sand; some areas are a poor source below a depth of about 5 to 6 feet; generally excessive fines.
Mhoon: Mh	Poor: poorly drained	Poor: poorly drained; moderate to low traffic-supporting capacity.	Unsuitable: no sand
Natchez: NaE	Good	Poor: moderate traffic-supporting capacity; excessive slopes.	Unsuitable: no sand
Newellton: Ne, NeU, Nf	Poor: clayey material; difficult to work. Good between depths of 15 and 39 inches.	Poor in upper 15 inches: low traffic-supporting capacity; high shrink-swell potential. Fair below a depth of 15 inches: somewhat poorly drained; moderate traffic-supporting capacity.	Unsuitable: generally no sand; in places poor below a depth of 39 inches; excessive fines.
Robinsonville: Ro, Rs	Good	Fair: moderate traffic-supporting capacity.	Unsuitable to poor: generally no sand; thin layers of sandy material have excessive fines.

properties of the soils—Continued

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Land leveling
Moderately slow permeability; seasonal high water table.	Poor to fair stability and compaction characteristics; medium compressibility; poor resistance to piping and erosion.	Poorly drained; seasonal high water table; moderately slow permeability; surface ponding.	Moderate intake rate; moderate available water capacity.	Shallow depressions in surface; poorly drained; seasonal high water table.
Moderately slow permeability.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Moderately well drained soil.	Slow intake rate; moderate available water capacity; slopes make water control difficult.	Slope; fragipan below a depth of 26 inches limits practical depth of cut.
Moderately slow permeability.	Fair to poor stability and compaction characteristics; medium compressibility; poor resistance to piping and erosion.	Well-drained soil	Moderate intake rate; moderate available water capacity.	Soil features generally favorable.
Moderate permeability; slopes limit storage potential in most areas.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Well-drained soil	Moderate intake rate; high available water capacity; slopes make water control difficult.	Slopes require excessive cuts in most tracts.
Soil features generally favorable; seasonal high water table; subject to frequent flooding.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Poorly drained; seasonal high water table; slow permeability; surface ponding; subject to frequent flooding.	Slow intake rate; high available water capacity; subject to frequent flooding.	Shallow depressions in surface; poorly drained; seasonal high water table; somewhat difficult to grade in wet seasons; subject to frequent flooding.
Moderately rapid permeability; slopes limit storage potential.	Poor stability and compaction characteristics; moderate permeability when compacted; medium compressibility; poor resistance to piping and erosion.	Well-drained soil	Practice not applicable; slope.	Practice not applicable; slope.
Moderately rapid permeability below a depth of 39 inches; Nf subject to frequent flooding.	Fair stability and compaction characteristics when well mixed; medium to high compressibility.	Somewhat poorly drained; seasonal high water table; slow permeability; surface ponding; Nf subject to frequent flooding.	Rapid intake rate when dry and cracked; slow intake rate otherwise; high available water capacity; Nf subject to frequent flooding.	Shallow depressions in surface; difficult to grade in wet seasons; somewhat poorly drained; seasonal high water table; Nf subject to frequent flooding.
Moderately rapid perbility; Rs subject to frequent flooding.	Poor to fair stability and compaction characteristics; moderate permeability when compacted; medium compressibility; poor resistance to piping and erosion.	Well-drained soil	Moderate to moderately rapid intake rate; Rs subject to frequent flooding.	Soil features generally favorable; Rs subject to frequent flooding.

TABLE 9.—*Interpretations of engineering*

Soil series and map symbols	Suitability as a source of—		
	Topsoil	Road fill	Sand
Sharkey: Sh, Sk	Poor: poorly drained; plastic, clayey material.	Poor: poorly drained; low traffic-supporting capacity; high shrink-swell potential; plastic, clayey material.	Unsuitable: no sand
Tunica: Tn, TnU, Tu	Poor: poorly drained; plastic, clayey material.	Poor: poorly drained; low traffic-supporting capacity; high shrink-swell potential; plastic, clayey material at a depth of less than 27 inches; material below is fair to good except for poor drainage; moderate to high traffic-supporting capacity.	Unsuitable to poor: in some areas is sand with excessive fines below a depth of 55 inches.
Zachary: Za	Poor: poorly drained	Poor: poorly drained; moderate to low traffic-supporting capacity.	Unsuitable: no sand

Engineering interpretations

Table 9 contains selected information useful to engineers and others who plan to use soil material in construction of highways, farm facilities, and structures for controlling water and conserving soil. Detrimental or undesirable features are emphasized, but very important desirable features may also be listed. The ratings and other interpretations in this table are based on estimated engineering properties of the soil in table 8; on available test data, including those in table 10; and on field experience. Though the information applies only to soil at the depths indicated in table 8, it is reasonably reliable to a depth of about 6 feet. Specific values should not be assigned to the ratings of bearing capacity given in table 9.

Topsoil is soil material used for spreading over barren surfaces, lawns, and gardens to improve soil conditions for establishing or maintaining adapted vegetation.

Roadfill is the material used for embankments to support the subbase and base course or surface course. The ratings indicate performance of soil material moved from borrow areas for these purposes.

Sand ratings are based on the probability that the soil contains deposits of sand. The ratings do not indicate quality or size of the deposits.

Pond reservoir areas are affected mainly by loss of water by seepage, and the soil features are those, such as the permeability rate, that influence such seepage.

Embankments, dikes, and levees are low structures designed to impound or divert water. The soil features of both subsoil and substratum are those important to the use of soils for constructing embankments, dikes, and levees. Some important features are stability and compaction characteristics, compressibility, and shrink-swell potential.

Drainage of cropland and pasture is essential to the efficient and economical use of many of the soils that have restricted drainage. The soil features considered are those that affect the installation and performance of drainage works, such as permeability, natural drainage, and stability of channels.

Irrigation during part of the growing season is beneficial to many of the commonly grown crops and is essential in rice culture. The soil features considered are those which affect the suitability of soils for irrigation, such as intake rate and available water capacity.

Land leveling reshapes the land surface by removing knolls, mounds, and ridges and by filling swales, potholes, and gullies. It insures uniform spread of irrigation water and improves surface drainage. The features considered are those that affect the reshaping of the land surface, such as the water table, natural drainage, susceptibility to flooding, and restrictive or toxic layers in the soil.

Throughout the county bedrock is well below the depths to which the soils have been sampled. Thus, the presence of bedrock is not a factor to be considered in planning construction.

Deposits of gravel suitable for road surfacing are randomly distributed on the eastern slopes of Crowley Ridge. Rarely are the gravel deposits exposed, and most of them are at a depth of a few feet. Some tracts have been mined. These spots are included in areas of Memphis

properties of the soils—Continued

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Land leveling
Soil features generally favorable; seasonal high water table; Sk subject to frequent flooding.	Fair to poor stability and compaction characteristics; high compressibility; high shrink-swell potential; plastic, clayey material.	Poorly drained; seasonal high water table; very slow permeability; surface ponding; Sk subject to frequent flooding.	Rapid intake rate when dry and cracked, very slow intake rate otherwise; high available water capacity; Sk subject to frequent flooding.	Shallow depressions in surface; difficult to grade in wet seasons; poorly drained; seasonal high water table; Sk subject to frequent flooding.
Moderate to rapid permeability below a depth of 27 inches; unit Tu subject to frequent flooding.	Fair stability and compaction characteristics when well mixed; medium to high compressibility.	Poorly drained; seasonal high water table; very slow permeability; surface ponding; Tu subject to frequent flooding.	Rapid intake rate when dry and cracked, very slow intake rate otherwise; high available water capacity; Tu subject to frequent flooding.	Shallow depressions in surface; difficult to grade in wet seasons; poorly drained; seasonal high water table; Tu subject to frequent flooding.
Soil features generally favorable; seasonal high water table; subject to frequent flooding.	Poor to fair stability and compaction characteristics; medium to high compressibility; fair resistance to piping when well mixed.	Poorly drained; seasonal high water table; slow permeability; surface ponding; subject to frequent flooding.	Slow intake rate; high available water capacity; subject to frequent flooding.	Shallow depressions in surface; poorly drained; seasonal high water table; subject to frequent flooding.

silt loam, 12 to 40 percent slopes, and are shown on the map. Generally, these deposits are not suitable for aggregate without washing and screening.

Precision land grading is an important measure in efficient water management on many of the soils in the county. Because of the shallow depth to layers that are high in sodium, the Bonn soils are generally unsuitable for grading. Careful preliminary investigation is required to determine the depth to layers that are high in sodium if Foley soils are to be graded. Design must provide for a sufficient rooting zone above the high-sodium layers to prevent detrimental effects on plants.

Terracing is not a suitable water control measure for most of the soils in the county. On the bottom lands, slopes are gentle, short, and irregular. On the uplands, many of the slopes are too steep for proper construction of terraces. Runoff water from such areas can best be controlled by vegetation. Calloway, Grenada, Loring, and some of the Memphis soils have slopes of less than 8 percent. Soil features are generally favorable for constructing terraces on these soils. Terraces generally cannot be maintained on soils high in silt content and steeper than 6 to 8 percent.

Most of the level soils on the loess uplands have excess water on and in the soil, but many tracts have had surface drains installed. Experience and a limited amount of test data have shown that these soils generally are highly dispersed, and therefore they are very erodible and are difficult to stabilize in fresh cuts. Indicators of dispersed soils are piping in gullies and road cuts, surface puddling when wet, and crusting when dry. Both the percentage of the soil mass that is clay-size particles and the percentage of the clay that is dispersed are important factors. Many of these soils are critically dispersed because of a relatively low percentage of clay and a high percentage of silt-size particles, which are typically 100 percent dispersed. Furthermore, soil layers that have a high sodium content generally are highly dispersed.

Additional interpretations of engineering uses of soils are given in the section "Town and Country Planning."

Engineering test data

Table 10 contains the results of engineering tests performed by the Arkansas State Highway Department on three soils important in Phillips County. The table shows the specific location where samples were taken, the depth to which sampling was done, and the results of tests to determine particle-size distribution and other properties significant in soil engineering.

Maximum dry density is the maximum dry unit weight of the soil when it has been compacted at optimum moisture content by the prescribed method of compaction. The moisture content which gives the highest dry unit weight is called the optimum moisture content for the specific method of compaction.

Mechanical analyses show the percentages, by weight of soil particles, that would pass sieves of specified sizes. Sand and other coarser materials do not pass through the No. 200 sieve. Silt and clay pass through the No. 200 sieve. Silt is that material larger than 0.002 millimeter in diameter that passes through the No. 200 sieve, and

TABLE 10.—*Engineering test data*

[Tests performed by the Arkansas State Highway Department in accordance with standard procedures of the American Association of State Highway Officials (AASHO)]

Soil name and location	Parent material	SCS report number 70–Ark–54–	Depth	Moisture-density [1]		Mechanical analysis [2] — Percentage less than 3 inches passing sieve [3]—			Liquid limit	Plasticity index	Classification	
				Maximum dry density	Optimum moisture	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)			AASHO [4]	Unified [5]
			Inches	*Lb.per cu.ft.*	*Percent*							
Calloway silt loam: NW¼SW¼SE¼ sec. 35, T. 2 S., R. 1 E. (Modal)	Loess.	23–1	0–4	102	19	[6] 98	94	93	------	[7] NP	A–4(4)	ML
		23–3	7–19	106	18	[6] 99	96	95	------	NP	A–4(4)	ML
		23–5	27–33	103	20	[6] 99	96	94	42	23	A–7–6(23)	CL
Loring silt loam: SW¼NE¼SE¼ sec. 2, T. 2 S., R. 3 E. (Modal)	Loess.	25–1	0–5	108	16	------	100	99	26	2	A–4(2)	ML
		25–3	9–26	103	21	------	------	100	41	15	A–7–6(18)	ML–CL
		25–5	32–41	106	19	------	100	99	37	16	A–6(17)	CL
Memphis silt loam: SE¼SW¼SW¼ sec. 30, T. 1 S., R. 5 E. (Modal)	Loess.	24–1	0–5	95	21	------	100	99	------	NP	A–4(4)	ML
		24–2	5–20	102	21	------	------	100	39	14	A–6(16)	ML–CL
		24–6	50–66	105	20	------	------	100	33	8	A–4(9)	ML–CL

[1] Based on AASHO Designation T 99–57, Method A (*1*).
[2] Mechanical analyses according to AASHO Designation T 88–57 (*1*). Results by this procedure may differ from the results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the various grain-size fractions are calculated on the basis of all material up to and including that 3 inches in diameter. In the SCS soil survey procedure, the material coarser than 2.0 millimeters in diameter is excluded from the calculations of grain-size fractions. The mechanical analyses data used in this table are not intended for naming textural classes of soil.
[3] 100 percent passed the 3-inch sieve.
[4] Based on AASHO Designation M 145–66 (*1*).
[5] Based on ASTM Designation D 2487–66 T.
[6] 100 percent passed the No. 4 sieve.
[7] NP=Nonplastic.

clay is that fraction passing through the No. 200 sieve that is smaller than 0.002 millimeter in diameter.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a solid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from solid to plastic. The liquid limit is the moisture content at which the material changes from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Town and Country Planning

Table 11 gives the degree and kind of limitations of the soils of Phillips County for selected nonfarm uses. The degrees of limitation reflect all the features of the given soil, to a depth of 6 feet, that affect a particular use.

A rating of *slight* means that the soils have properties favorable for the rated use. Limitations are so minor that they can be easily overcome. Good performance and low maintenance can be expected from these soils. A rating of *moderate* means that the soils have properties moderately favorable for the rated use. Limitations can be overcome or modified with planning, design, or special maintenance. A rating of *severe* means that the soils have one or more properties unfavorable for the rated use. Limitations are difficult and costly to modify or overcome, requiring major soil reclamation, special design, or intense maintenance.

The properties considered in evaluating the limitations for the uses listed in table 11 are given in the paragraphs that follow.

The column titled dwellings without basements rates undisturbed soils evaluated for single-family dwellings of three stories or less. Emphasis is on foundation requirements, but soil slope, susceptibility to flooding, and seasonal wetness also are considered. The properties that affect suitability for foundations are those that affect bearing capacity and settlement under load, as well as those that affect excavation and construction cost. The properties affecting bearing capacity and settlement of the natural soil are density, wetness, flooding, plasticity, texture, and shrink-swell potential. Shrink-swell potential refers to expansion and contraction of the soil with changes in moisture content. Properties affecting the ease and amount of excavation are wetness and slope. Also considered are soil properties that influence installation of utility lines, such as those between dwellings and trunk lines. Excluded are soil limitations for sewage disposal and for corrosivity of steel and concrete in soil. Such limitations are provided in separate interpretations in tables 11 and 8, respectively.

Septic tank absorption fields are soil areas used for absorption of effluent from septic tanks. A subsurface tile system is laid in such as way that effluent is uniformly distributed in the soil. Properties considered are permeability, depth to a water table, depth to bedrock, and flood hazard. A permeability rate slower than 0.60 inches per hour constitutes a severe limitation, and a permeability rate between 0.60 and 1 inch per hour, a moderate limitation. A seasonal water table, or impervious material less than 4 feet below the bottom of the tile trench constitutes a severe limitation, and between 4 and 6 feet constitutes a modern limitation. Soils subject to flooding have a severe limitation.

Sewage lagoons are shallow lakes used to hold sewage during bacterial decomposition. Properties considered are permeability, slope, depth to the water table, and suitability of the reservoir site material for the dam. Permeability of more than 2 inches per hour is a severe limitation, and permeability of 0.60 to 2 inches per hour is a moderate limitation. Slope of more than 7 percent is a severe limitation, and slope of 2 to 7 percent is a moderate limitation. A permanent water table within 40 inches of the surface is a severe limitation, and one between 40 and 60 inches is a moderate limitation. Soils that are subject to flooding have a severe limitation. Requirements for the dam are the same as for other embankments given in table 9.

Sanitary landfill is a trench-type landfill in which refuse is buried. The refuse is covered with at least a 6-inch layer of compacted soil material daily. Soil material excavated in digging the trench is used for this purpose. A final cover of soil material at least 2 feet thick is placed on the landfill when the trench is full.

Soil surveys are not a substitute for detailed geologic investigations, because soil borings are normally limited to a depth of 5 or 6 feet. Thus, they do not provide the needed data on the soils at greater depths. Soil surveys are especially useful in determining whether additional investigations are warranted or not, thus saving the time and expense of more detailed investigations on soils that are not suitable for sanitary landfills. Important soil properties are drainage and hazard of flooding, depth to a seasonal high water table, soil texture, and slope.

Soils that are subject to flooding, that have a seasonal high water table within a depth of 6 feet, or that have permeability faster than 2 inches per hour have severe limitations. Poor drainage is a severe limitation and somewhat poor drainage is a moderate limitation. Slope of more than 25 percent is a severe limitation, and slope of 15 to 25 percent is a moderate limitation. Clayey soils have a severe limitation, and generally the more plastic loamy soils have a moderate limitation.

For information about use of the soils for area-type sanitary landfills, contact the local office of the Soil Conservation Service.

Properties that affect design and construction of roads and streets are those that affect stability, traffic-supporting capacity, workability, and the amount of cut and fill needed. Engineering classifications and the shrink-swell potential give an indication of the traffic-supporting capacity. Wetness and flooding affect stability. Slope and wetness affect the ease of excavation and the amount of cut and fill needed to reach an even grade.

Light industry structures of less than three stories have requirements similar to those for dwellings, except that slopes are more critical. Generally, slopes of more than 8 percent have a severe limitation, and slopes of 4 to 8 percent have a moderate limitation.

Recreation facilities are soil areas used for camping, picnicking, or intensive play. Trafficability, permeability, and topography are important properties. Trafficability is related to texture of the surface layer. It refers to movement of pedestrian, bicycle, and light vehicular traffic. Trafficability is no more than a slight limitation on loamy soils that are not likely to be flooded and have a water table below a depth of 30 inches during the season of heavy use. On clayey soils trafficability is a severe limitation.

The detailed soil map and information in table 11 are guides for evaluating areas for the specific uses. They do not eliminate the need for detailed onsite investigations before a final determination is made.

Additional information that may be useful in town and country planning is given in the section "Engineering Uses of the Soils."

Formation and Classification of the Soils

In this section the factors that affect soil formation in Phillips County and the processes of horizon differentiation are discussed. Then the system of soil classification is explained, and the soil series are placed in some of the higher categories of that system. The soil series in the county, including a profile representative of each series, are described in the section "Descriptions of the Soils."

Factors of Soil Formation

Soil is formed by weathering and other processes that act upon the soil. The characteristics of the soil at any given point depend on climate, living organisms, parent material, relief, and time. Each factor acts on the soil and modifies the effect of the other four. When climate, living organisms, or any other one of the five factors is varied to a significant extent, a different soil may be formed (*10*).

Climate and living organisms are the active forces in soil formation. Relief modifies the effects of climate and living organisms, mainly by its influence on temperature and runoff. Because climate, vegetation, parent material, and relief interact over a period of time, time is the fifth factor of soil formation. The effect of time is also reflected in the soil characteristics.

The interaction of the five factors of soil formation is more complex for some soils than for others. The five factors and how they interact to form some of the soils in the county are discussed in the following paragraphs.

TABLE 11.—*Degree and kinds of limitations for building sites,*

Soil series and map symbols	Dwellings without basements [1]	Septic tank absorption fields	Sewage lagoons [2]	Sanitary land fill (trench type) [3]
Alligator: Ac, Ag	Severe: poorly drained; seasonal high water table; high shrink-swell potential; low bearing capacity; Ag subject to frequent flooding.	Severe: very slow permeability; seasonal high water table; Ag subject to frequent flooding.	Sight for Ac; Severe for Ag: subject to frequent flooding.	Severe: seasonal high water table; poorly drained; plastic, clayey material; Ag subject to frequent flooding.
Amagon: Am	Severe: poorly drained; seasonal high water table; low bearing capacity.	Severe: slow permeability; seasonal high water table.	Slight	Severe: seasonal high water table; poorly drained.
Arkabutla: Ar, As	Severe: seasonal high water table; moderate to low bearing capacity; As subject to frequent flooding.	Severe: moderately slow permeability; seasonal high water table; As subject to frequent flooding.	Slight for Ar. Severe for As: subject to frequent flooding.	Severe: seasonal high water table; As subject to frequent flooding.
Beulah: BeU	Slight	Slight	Severe: moderately rapid permeability.	Severe: moderately rapid permeability.
Bonn: Bo	Severe: poorly drained; seasonal high water table; moderate to low bearing capacity; high sodium content makes soil unsuitable for most landscaping plants.	Severe: seasonal high water table; very slow permeability.	Slight	Severe: poorly drained seasonal high water table; difficult to work; difficult to reclaim filled sites.
Calhoun: Ca	Severe: poorly drained; seasonal high water table; low bearing capacity.	Severe: seasonal high water table; slow permeability.	Slight to moderate: fair to good reservoir site material.	Severe: poorly drained; seasonal high water table.
Calloway: CbA, CbB	Severe for CbA: seasonal high water table. Moderate for CbB: somewhat poorly drained; moderate bearing capacity.	Severe: slow permeability; seasonal high water table.	Slight to moderate: fair to good reservoir site material; some slopes are more than 2 percent.	Severe: seasonal high water table; somewhat poorly drained.
Commerce: Cm, Cn	Moderate for Cm: somewhat poorly drained; moderate bearing capacity. Severe for Cn: subject to frequent flooding.	Severe: moderately slow permeability; seasonal high water table; Cn subject to frequent flooding.	Moderate for Cm: fair reservoir site material. Severe for Cn: subject to frequent flooding.	Severe: seasonal high water table; somewhat poorly drained; Cn subject to frequent flooding.
Convent: Co	Moderate: somewhat poorly drained; moderate bearing capacity.	Severe: seasonal high water table.	Moderate: fair reservoir site material; moderate permeability.	Severe: seasonal high water table; somewhat poorly drained; moderate permeability.

See footnotes at end of table.

sewage and solid waste disposal systems, and recreational facilities

Local roads and streets	Light industry [1]	Recreation		
		Campsites	Picnic areas	Intensive play areas
Severe: poorly drained; low traffic-supporting capacity; high shrink-swell potential; Ag subject to frequent flooding.	Severe: poorly drained; seasonal high water table; high shrink-swell potential; low bearing capacity; Ag subject to frequent flooding.	Severe: poorly drained; seasonal high water table; very slow permeability; dominantly clayey surface; poor trafficability; Ag subject to frequent flooding.	Severe: poorly drained; seasonal high water table; dominantly clayey surface; poor trafficability; Ag subject to frequent flooding.	Severe: poorly drained; seasonal high water table; very slow permeability; dominantly clayey surface; poor trafficability; Ag subject to frequent flooding.
Severe: poorly drained; low traffic-supporting capacity.	Severe: poorly drained; seasonal high water table; low bearing capacity.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.
Moderate to severe: somewhat poorly drained; moderate to low traffic-supporting capacity; moderate shrink-swell potential. Severe for As: subject to frequent flooding.	Severe: somewhat poorly drained; seasonal high water table; moderate shrink-swell potential; moderate to low bearing capacity; As subject to frequent flooding.	Moderate for Ar: somewhat poorly drained; seasonal high water table; moderately slow permeability. Severe for As: subject to frequent flooding.	Moderate for Ar: somewhat poorly drained; seasonal high water table. Severe for As: subject to frequent flooding.	Severe: somewhat poorly drained; seasonal high water table; moderately slow permeability; As subject to frequent flooding.
Slight	Slight	Slight	Slight	Generally slight, but moderate where slopes are more than 2 percent.
Severe: poorly drained; low traffic-supporting capacity; high sodium content; material dispersed and difficult to stabilize.	Severe: poorly drained; seasonal high water table; moderate to low bearing capacity.	Severe: poorly drained; seasonal high water table; very slow permeability; difficult to maintain vegetation.	Severe: poorly drained; seasonal high water table; difficult to maintain vegetation.	Severe: poorly drained; seasonal high water table; very slow permeability; difficult to maintain vegetation.
Severe: poorly drained; low traffic-supporting capacity.	Severe: poorly drained; seasonal high water table; low bearing capacity.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.
Moderate: somewhat poorly drained; moderate traffic-supporting capacity.	Severe for CbA: seasonal high water table. Moderate for CbB: somewhat poorly drained; moderate bearing capacity.	Moderate: somewhat poorly drained; seasonal high water table; slow permeability.	Moderate: somewhat poorly drained; seasonal high water table.	Moderate: somewhat poorly drained; seasonal high water table; slow permeability; some slopes are more than 2 percent.
Moderate for Cm: somewhat poorly drained; moderate traffic-supporting capacity. Severe for Cn: subject to frequent flooding.	Moderate for Cm: somewhat poorly drained; moderate bearing capacity. Severe for Cn: subject to frequent flooding.	Moderate for Cm: somewhat poorly drained; seasonal high water table; moderately slow permeability. Severe for Cn: subject to frequent flooding.	Moderate for Cm: somewhat poorly drained; seasonal high water table. Severe for Cn; subject to frequent flooding.	Moderate for Cm: somewhat poorly drained; seasonal high water table; moderately slow permeability. Severe for Cn: subject to frequent flooding.
Moderate: somewhat poorly drained; moderate traffic-supporting capacity.	Moderate: somewhat poorly drained; moderate bearing capacity.	Moderate: somewhat poorly drained; seasonal high water table.	Moderate: somewhat poorly drained; seasonal high water table.	Moderate: somewhat poorly drained; seasonal high water table.

TABLE 11.—*Degree and kinds of limitations for building sites, sewage*

Soil series and map symbols	Dwellings without basements [1]	Septic tank absorption fields	Sewage lagoons [2]	Sanitary land fill (trench type) [3]
Crevasse: Cr	Severe: subject to frequent flooding.	Severe: subject to frequent flooding.	Severe: rapid permeability; subject to frequent flooding.	Severe: rapid permeability; subject to frequent flooding.
Dubbs: DsU	Moderate: moderate bearing capacity.	Moderate to severe: moderate permeability; seasonal water table at a depth of 3 to 5 feet.	Moderate: moderate permeability; some slopes of 2 to 3 percent.	Severe: seasonal water table at a depth of 3 to 5 feet.
Dundee: Du	Moderate to severe: somewhat poorly drained; seasonal high water table; moderate to low bearing capacity.	Severe: moderately slow permeability; seasonal high water table.	Slight	Severe: seasonal high water table.
Falaya: Fa	Severe: somewhat poorly drained; seasonal high water table; moderate bearing capacity.	Severe: moderately slow permeability; seasonal high water table.	Moderate: fair reservoir site material.	Severe: seasonal high water table.
Fluvaquents, frequently flooded: Ff.	Severe: variable material; subject to frequent flooding.	Severe: variable material; subject to frequent flooding.	Severe: variable material; subject to frequent flooding.	Severe: variable material; subject to frequent flooding.
Foley: Fo	Severe: poorly drained; seasonal high water table; moderate to low bearing capacity.	Severe: slow permeability; seasonal high water table.	Slight to moderate: fair to good reservoir site material.	Severe: poorly drained; seasonal high water table.
Grenada: GrB	Moderate: moderate bearing capacity.	Severe: slow permeability.	Slight to moderate: fair to good reservoir site material; some slopes of 2 to 3 percent.	Slight to moderate: seasonal high water table for brief periods.
Henry: He	Severe: poorly drained; seasonal high water table; low bearing capacity.	Severe: seasonal high water table; slow permeability.	Moderate: fair reservoir site material.	Severe: poorly drained; seasonal high water table.
Jeanerette: Je	Severe: poorly drained; seasonal high water table; low to moderate bearing capacity.	Severe: seasonal high water table; moderately slow permeabilty.	Slight to moderate: fair to good reservoir site material.	Severe: poorly drained; seasonal high water table.
Lagrange: La	Severe: poorly drained; seasonal high water table; moderate bearing capacity.	Severe: seasonal high water table; moderately slow permeability.	Moderate: fair reservoir site material.	Severe: poorly drained; seasonal high water table.
Loring: LoB, LoC2	Moderate: moderate bearing capacity.	Severe: moderately slow permeability; seasonal water table at a depth of 2 to 3 feet for brief periods.	Moderate where slopes are 2 to 7 percent. Severe where slopes are more than 7 percent.	Slight
Marvell: Ma	Slight	Severe: moderately slow permeability.	Moderate: fair reservoir site material.	Moderate to severe: occasional seasonal water table below a depth of 3 feet.

See footnotes at end of table.

and solid waste disposal systems, and recreational facilities—Continued

Local roads and streets	Light industry [1]	Recreation		
		Campsites	Picnic areas	Intensive play areas
Severe: subject to frequent flooding.	Severe: subject to frequent flooding.	Severe: sandy surface; poor trafficability; difficult to maintain vegetation; subject to frequent flooding.	Severe: sandy surface; poor trafficability; subject to frequent flooding.	Severe: sandy surface; poor trafficability; difficult to maintain vegetation; subject to frequent flooding.
Moderate: moderate traffic-supporting capacity.	Moderate: moderate bearing capacity.	Slight	Slight	Slight where slopes are less than 2 percent. Moderate where slopes are more than 2 percent.
Moderate to severe: somewhat poorly drained; moderate to low shrink-swell potential; moderate to low traffic-supporting capacity.	Moderate to severe: somewhat poorly drained; seasonal high water table; moderate to low bearing capacity.	Moderate: somewhat poorly drained; seasonal high water table; moderately slow permeability.	Moderate: somewhat poorly drained; seasonal high water table.	Moderate: somewhat poorly drained; seasonal high water table; moderately slow permeability.
Moderate: somewhat poorly drained; moderate traffic-supporting capacity.	Severe: somewhat poorly drained; seasonal high water table; moderate bearing capacity.	Moderate: somewhat poorly drained; seasonal high water table; moderately slow permeability.	Moderate: somewhat poorly drained; seasonal high water table.	Moderate: somewhat poorly drained; seasonal high water table; moderately slow permeability.
Severe: variable material; subject to frequent flooding.	Severe: variable material; subject to frequent flooding.	Severe: variable material; subject to frequent flooding.	Severe: variable material; subject to frequent flooding.	Severe: variable material; subject to frequent flooding.
Severe: poorly drained; low traffic-supporting capacity.	Severe: poorly drained; seasonal high water table; moderate to low bearing capacity.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.
Moderate: moderate traffic-supporting capacity.	Moderate: moderate bearing capacity.	Moderate: slow permeability.	Slight	Moderate: slow permeability; some slopes are more than 2 percent.
Severe: poorly drained; low traffic-supporting capacity.	Severe: poorly drained; seasonal high water table; low bearing capacity.	Severe: poorly drained; seasonal high water table; slow permeability.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table; slow permeability.
Severe: poorly drained; moderate to low traffic-supporting capacity.	Severe: poorly drained; seasonal high water table; low to moderate bearing capacity.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.
Severe: poorly drained; moderate traffic-supporting capacity.	Severe: poorly drained; seasonal high water table; moderate bearing capacity.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.	Severe: poorly drained; seasonal high water table.
Moderate: moderate traffic-supporting capacity.	Moderate: moderate bearing capacity; slope.	Moderate: moderately slow permeability.	Slight	Moderate where slopes are less than 6 percent: moderately slow permeability. Severe where slopes are more than 6 percent.
Slight	Slight	Slight	Slight	Slight.

TABLE 11.—*Degree and kinds of limitations for building sites, sewage*

Soil series and map symbols	Dwellings without basements [1]	Septic tank absorption fields	Sewage lagoons [2]	Sanitary land fill (trench type) [3]
Memphis: MeB, MeC2, MeD2, MeE.	Moderate where slopes are less than 15 percent; moderate bearing capacity. Severe where slopes are more than 15 percent.	Generally slight. Moderate where slopes are 8 to 15 percent. Severe where slopes are more than 15 percent.	Generally slight. Moderate where slopes are less than 7 percent; moderate permeability. Severe where slopes are more than 7 percent.	Moderate where slopes are 15 to 25 percent. Severe where slopes are more than 25 percent.
Mhoon: Mh	Severe: poorly drained; seasonal high water table; moderate to low bearing capacity; subject to frequent flooding.	Severe: seasonal high water table; slow permeability; subject to frequent flooding.	Severe: subject to frequent flooding.	Severe: seasonal high water table; poorly drained; subject to frequent flooding.
Natchez: NaE	Severe: slope	Severe: slope	Severe: slope; moderately rapid permeability.	Severe: slope; moderately rapid permeability.
Newellton: Ne, NeU, Nf.	Severe: somewhat poorly drained; seasonal high water table; high shrink-swell potential and low bearing capacity in upper 15 inches; Nf subject to frequent flooding.	Severe: seasonal high water table; Nf subject to frequent flooding.	Severe: moderately rapid permeability below a depth of 39 inches; Nf subject to frequent flooding.	Severe: seasonal high water table; moderately rapid permeability below a depth of 39 inches; Nf subject to frequent flooding.
Robinsonville: Ro, Rs	Slight for Ro. Severe for Rs: subject to frequent flooding.	Slight for Ro: Severe for Rs: subject to frequent flooding.	Severe: moderately rapid permeability; Rs subject to frequent flooding.	Severe: moderately rapid permeability; Rs subject to frequent flooding.
Sharkey: Sh, Sk	Severe: poorly drained; seasonal high water table; high shrink-swell potential; low bearing capacity; Sk subject to frequent flooding.	Severe: seasonal high water table; very slow permeability; Sk subject to frequent flooding.	Slight for Sh. Severe for Sk; subject to frequent flooding.	Severe: seasonal high water table; poorly drained; plastic, clayey material; Sk subject to frequent flooding.
Tunica: Tn, TnU, Tu	Severe: poorly drained; seasonal high water table; high shrink-swell potential and low bearing capacity in upper 27 inches; Tu subject to frequent flooding.	Severe: seasonal high water table; very slow permeability; Tu subject to frequent flooding.	Slight for Tn, TnU. Severe for Tu; subject to frequent flooding.	Severe: seasonal high water table; poorly drained; plastic, clayey material in upper 27 inches; Tu subject to frequent flooding.
Zachary: Za	Severe: poorly drained; seasonal high water table; low bearing capacity; subject to frequent flooding.	Severe: seasonal high water table; slow permeability; subject to frequent flooding.	Severe: subject to frequent flooding.	Severe: seasonal high water table; poorly drained; subject to frequent flooding.

[1] Engineers and others should not apply specific values to estimates given for bearing capacity of soils.
[2] For information about lagoon embankments, see table 9, p. 50, column "Embankments, dikes, and levees."

and solid waste disposal systems, and recreational facilities—Continued

Local roads and streets	Light industry [1]	Recreation		
		Campsites	Picnic areas	Intensive play areas
Moderate where slopes are less than 15 percent; moderate traffic-supporting capacity. Severe where slopes are more than 15 percent.	Moderate where slopes are less than 8 percent; moderate bearing capacity. Severe where slopes are more than 8 percent.	Slight where slopes are less than 8 percent. Moderate where slopes are 8 to 15 percent. Severe where slopes are more than 15 percent.	Slight where slopes are less than 8 percent. Moderate where slopes are 8 to 15 percent. Severe where slopes are more than 15 percent.	Slight where slopes are less than 2 percent. Moderate where slopes are 2 to 6 percent. Severe where slopes are more than 6 percent.
Severe: poorly drained; subject to frequent flooding; moderate to low traffic-supporting capacity.	Severe: poorly drained; seasonal high water table; moderate to low bearing capacity; subject to frequent flooding.	Severe: poorly drained; seasonal high water table; subject to frequent flooding.	Severe: poorly drained; seasonal high water table; subject to frequent flooding.	Severe: poorly drained; seasonal high water table; subject to frequent flooding.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: somewhat poorly drained; high shrink-swell potential and low traffic-supporting capacity in upper 15 inches; Nf subject to frequent flooding.	Severe: somewhat poorly drained; seasonal high water table; high shrink-swell potential and low bearing capacity in upper 15 inches; Nf subject to frequent flooding.	Severe: somewhat poorly drained; seasonal high water table; slow permeability; dominantly clayey surface layer; poor trafficability; Nf subject to frequent flooding.	Severe: somewhat poorly drained; seasonal high water table; dominantly clayey surface layer; poor trafficability; Nf subject to frequent flooding.	Severe: somewhat poorly drained; seasonal high water table; slow permeability; dominantly clayey surface; poor trafficability; Nf subject to frequent flooding.
Slight to moderate for Ro: moderate to high traffic-supporting capacity. Severe for Rs: subject to frequent flooding.	Slight for Ro. Severe for Rs: subject to frequent flooding.	Slight for Ro: Severe for Rs: subject to frequent flooding.	Slight for Ro. Severe for Rs: subject to frequent flooding.	Slight for Ro. Severe for Rs: subject to frequent flooding.
Severe: poorly drained; high shrink-swell potential; low traffic-supporting capacity; Sk subject to frequent flooding.	Severe: poorly drained; seasonal high water table; high shrink-swell potential; low bearing capacity; Sk subject to frequent flooding.	Severe: poorly drained; seasonal high water table; very slow permeability; dominantly clayey surface; poor trafficability; Sk subject to frequent flooding.	Severe: poorly drained; seasonal high water table; dominantly clayey surface; poor trafficability; Sk subject to frequent flooding.	Severe: poorly drained; seasonal high water table; very slow permeability; dominantly clayey surface; poor trafficability; Sk subject to frequent flooding.
Severe: poorly drained; high shrink-swell potential and low traffic-supporting capacity in upper 27 inches; Tu subject to frequent flooding.	Severe: poorly drained; seasonal high water table; high shrink-swell potential and low bearing capacity in upper 27 inches; Tu subject to frequent flooding.	Severe: poorly drained; seasonal high water table; very slow permeability; dominantly clayey surface; poor trafficability; Tu subject to frequent flooding.	Severe: poorly drained; seasonal high water table; dominantly clayey surface; poor trafficability; Tu subject to frequent flooding.	Severe: poorly drained; seasonal high water table; very slow permeability; dominantly clayey surface; poor trafficability; Tu subject to frequent flooding.
Severe: poorly drained; low traffic-supporting capacity; subject to frequent flooding.	Severe: poorly drained; seasonal high water table; low bearing capacity; subject to frequent flooding.	Severe: poorly drained; seasonal high water table; subject to frequent flooding.	Severe: poorly drained; seasonal high water table; subject to frequent flooding.	Severe: poorly drained; seasonal high water table; subject to frequent flooding.

[3] Onsite studies of the underlying strata, water tables and hazards of aquifer pollution and drainage into ground water need to be made for land fills deeper than 5 feet.

Climate

The climate of Phillips County is characterized by mild winters, warm or hot summers, and generally abundant rainfall. The generally warm temperatures and high precipitation probably are similar to the climate under which the soils in the county formed. The average daily maximum temperature at Helena in July is about 92° F., and the average in January is about 51°. The total annual rainfall is about 50 inches and is well distributed throughout the year. For additional information about the climate, refer to the section "General Nature of the County."

The warm, moist climate promotes rapid soil formation and encourages rapid chemical reactions. The large amount of water that moves through the soil is instrumental in removing dissolved or suspended materials. Because remains of plants decompose rapidly, the organic acids thus formed hasten the formation of clay minerals and removal of carbonates. Because the soil is frozen only to shallow depths and for short periods, soil formation continues almost the year round. The climate throughout the county is uniform, though its effect is modified locally by runoff. Climate alone does not account for differences in the soils of the county.

Living organisms

The higher plants and animals, as well as insects, bacteria, and fungi, are important in the formation of soils. Among the changes they cause are gains and losses in organic matter and nitrogen in the soils, gains or losses in plant nutrients, and changes in structure and porosity.

Before Phillips County was settled, the native vegetation probably had more influence on soil formation than did animal activity. Hardwood forests, broken by swamps and a few canebrakes, covered the county. Differences in native vegetation seem to have been related mainly to variations in drainage and, to a lesser degree, parent material. Because the type of vegetation was relatively uniform over the county, differences among the soils cannot be directly related to vegetation.

Man is important to the future rate and direction of soil formation. He clears the forest, cultivates the soils, and introduces new kinds of plants. He adds fertilizer, lime, and chemicals for insect, disease, and weed control. Building levees for flood control, improving drainage, and grading the soil surface also affect the future development of soils. Results of these changes may not be evident for many centuries. Nevertheless, the complex of living organisms affecting soil formation in this county has been drastically changed by man. Thus, man has become the most important organism affecting soil formation.

Parent material

The soils of Phillips County formed in water-deposited alluvium and wind-transported loess. The alluvium was deposited by the Mississippi and Ohio Rivers (*4*) and in part reworked by the St. Francis and White Rivers and other major tributaries of the Mississippi River. The alluvium in the southern part of the county consists of a mixture of minerals washed from the many kinds of soil, rocks, and unconsolidated sediments in about 24 states (*20*). In this great basin, which extends from Montana to Pennsylvania, sedimentary rocks of various kinds are widespread. Other kinds of rocks also are exposed in many places and serve as sediment sources. Large areas of the upper basin are mantled by glacial drift and loess. Consequently, the alluvium consists of many kinds of minerals, most of which are but slightly weathered.

The wide range in texture of alluvium in the county results from differences in the site of deposition. When a river overflows and spreads over its flood plain, the coarse sediments are deposited in bands roughly parallel to the channel. Thus, low ridges known as natural levees are formed (*20*). On these ridges Beulah, Crevasse, Dubbs, and Robinsonville soils formed. Finer sediments, high in silt, are deposited as the floodwaters spread and lose velocity. These sediments contain some sand and clay. Here, soils such as Commerce, Dundee, and Amagon formed. When the flood recedes and water is left standing as shallow lakes or swamps, the clay and finer silt settle. In these sediments the Alligator, Newellton, Sharkey and Tunica soils formed.

This simple pattern of sediment distribution is not now common along the Mississippi River, because through the centuries the river channel has meandered back and forth across the flood plain. Sometimes the channel has cut out all or parts of natural levees. At other times it has deposited sandy or loamy sediments over slack-water clays, or slack-water clays over sandy or loamy sediments. The natural pattern of sediment distribution from a single channel has been truncated in many places, and more recent beds of alluvium have been superimposed. Newellton and Tunica soils, which formed in thin beds of clayey over coarser sediments, are examples of soils formed in these kinds of materials.

The soils on the uplands of the county formed in loess deposited during the Pleistocene epoch. This mantle of wind-transported material was deposited over older alluvium. The mantle is thick enough that the solum of the soils formed entirely in loess.

On Crowley Ridge the loess is 5 feet to more than 50 feet thick over a sandy and gravelly substratum. This substratum is exposed in gravel pits on the east face of the Ridge. It is a remnant of a broad outwash plain that once filled the Mississippi River valley at this latitude but was mostly removed before or during late Pliocene or early Pleistocene epochs. During much of the Pleistocene epoch, the Mississippi River flood plain was west of Crowley Ridge and the Ohio River flowed on the east side of the Ridge (*4*).

Thousands of years ago the wide trough carved west of Crowley Ridge was partially refilled with sediments by the Mississippi River in much the same manner as the river deposits of recent time were laid down. Finally, the vast complex of alluvial terraces west of the Ridge was abandoned by the Mississippi River in favor of the Ohio River channel on the east side of the ridge. The broad, abandoned flood plain was subsequently drained by smaller, more localized streams that occupied former braided channels of the Mississippi River. These smaller streams were not adequate to maintain the entire area as an active flood plain. Those parts of the plain above overflow were progressively mantled with loess during the same general period that the loess on Crowley Ridge was laid down. Generally, the loess has the same range in thickness on the plain as on the ridge. On the level parts of the plain, poorly drained soils such as Henry and Calhoun formed. In the nearly level to gently sloping areas, moderately well drained soils such as Grenada and Loring formed. The somewhat poorly drained Calloway soils formed at intermediate positions between these extremes.

The mantle of loess is unstratified, and it is mainly of silt-size particles. It is thickest on the southern end of Crowley Ridge, where it is as much as 70 feet or more in thickness. The loess in Phillips County is typical of the loess on the Southern Mississippi Valley Silty Uplands. Most soils formed in the loess are acid, though the content of bases is moderately high. An exception is the Natchez soils. They formed either in the youngest loess, or on surfaces where erosion has more nearly kept pace with soil formation. These soils are predominantly neutral to moderately alkaline because they are less leached than other soils formed in the loess.

Relief

Relief is the inequalities in elevation of a land surface. The other soil-forming factors are affected by relief through its effect on drainage, runoff, erosion, and percolation of water through the soil. Some of the greatest differences among the soils are caused mainly by differences in relief.

The bottom-land area of Phillips County has relief ranging from that of broad flats to undulating areas of swales alternated with low ridges. Dubbs soils formed on low ridges, whereas Dundee and Amagon soils formed in similar parent material but in lower, wetter positions on the landscape.

Local differences in elevation are predominantly less than 1 foot but range up to 4 or 5 feet in the areas of swales and low ridges. Differences in a few areas along streambanks are as much as 15 to 20 feet, but the total area of this greater relief is negligible. The highest elevation in the bottom-land area, about 185 feet above sea level, is in the northeastern part near the mouth of the St. Francis River. The lowest elevation, about 140 feet above sea level, is in the southwestern part near Steelman Lake. Crowley Ridge is in the upland area and is located in the northeastern part of the county. It is about 3 miles wide at the northern boundary of the county and tapers to an end south of Helena. The relief is characterized by short slopes between ridges and streams. Gradient ranges from 12 to 40 percent. The highest point above sea level is about 380 feet, and the lowest is about 220 feet. The well-drained Memphis and Natchez soils formed on these moderately steep and steep slopes.

That part of the uplands west of Crowley Ridge is level to moderately sloping. Most of it is level to nearly level. This area consists of poorly drained level tracts where Henry and Calhoun soils formed, broken by low ridges where mainly Calloway, Grenada, and Loring soils formed. The highest elevation above sea level is about 260 feet, adjacent to Crowley Ridge, and the lowest is about 165 feet, in the western part of the county.

Time

The length of time required for formation of a soil depends largely upon other factors of soil formation. Less time generally is required if the climate is warm and humid and the vegetation is luxuriant. If other factors are equal, less time also is required where the parent material is sandy or loamy than where it is clayey. It seems probable that the sediments now forming most of the land surface in Phillips County were deposited during and after the advance of the continental glaciers. The last of these glaciers retreated from the North Central States about 11,000 years ago (*6*, *7*). Thus in terms of geological time, the soils in Phillips County are young. In terms of soil formation, the age of the soils in the county varies widely. On the smoother parts of the uplands, the soils are more mature, but on the stronger slopes where geologic erosion has more nearly kept pace with soil formation, the soils have less thick, less strongly developed horizons. On young natural levees and in areas of local alluvium, the soil material has been in place so short a time that the soils show relatively little evidence of development. Many such areas receive fresh deposits of sediments at frequent intervals. In these areas are such soils as Mhoon, Falaya, Crevasse, Commerce, and Robinsonville.

Processes of Soil Formation

In this subsection a brief definition of the horizon nomenclature and processes responsible for soil formation are given.

The marks that the soil-forming factors leave on the soil are recorded in the soil profile, which is a succession of layers, or horizons, from the surface to the parent material that has been altered but little by soil-forming processes. The horizons differ in one or more properties, such as color, texture, structure, consistence, porosity, and reaction.

Most soil profiles contain three major horizons, called A, B, and C. Very young soils do not have a B horizon.

The A horizon can be the horizon of maximum accumulation of organic matter, called the A1 horizon or the surface layer, or it can be the horizon of maximum leaching of dissolved or suspended materials, called the A2 horizon or the subsurface layer.

The B horizon lies immediately beneath the A horizon and is sometimes called the subsoil. It is a horizon of maximum accumulation of dissolved or suspended materials, such as iron and clay. Commonly, the B horizon has blocky structure (*19*) and is firmer than the horizons immediately above and below it.

Beneath the B horizon is the C horizon, which has been affected but little by the soil-forming processes, although the C horizon can be materially modified by weathering. In some young soils, the C horizon immediately underlies the A horizon and has been slightly modified by living organisms, as well as by weathering.

Several processes have been active in the formation of soil horizons in the soils of Phillips County. Among these processes are (1) accumulation of organic matter, (2) leaching of calcium carbonates and bases, (3) reduction and transfer of iron, and (4) formation and translocation of silicate clay minerals. In most of the soils of the county, more than one of these processes has been active in soil formation.

Accumulation of organic matter in the upper part of the profile to form an A1 horizon has been an important process of soil formation. The soils of Phillips County range from high to low in content of organic matter.

Leaching of carbonates and bases has occurred to some degree in nearly all the soils of Phillips County. Among soil scientists, it is generally accepted that bases are leached downward in soils before silicate clay minerals begin to move. Some of the soils, such as Mhoon and Natchez soils, are only slightly leached, but most of the soils in the county are moderately leached, an important factor in horizon development.

Reduction and transfer of iron has occurred to a significant degree in the somewhat poorly drained and poorly drained soils of the county. In the naturally wet soils, this process is called gleying. Gray colors in the layers below the surface indicate the reduction and loss of iron. Some horizons contain reddish or yellowish mottles and concretions derived from segregated iron. Gleying is pronounced in many of the soils. Among the strongly gleyed soils are the Alligator, Sharkey, Tunica, Henry, Calhoun, Mhoon, and Zachary soils.

In several soils of Phillips County, the translocation of clay minerals has contributed to the formation of horizons. In most places the eluviated A2 horizon has been destroyed by cultivation, but in areas where an A2 horizon occurs, its structure is blocky or platy; clay content is less than in the lower horizons; and the soil is lighter in color. Generally, clay films have accumulated in pores and on surfaces of peds in the B horizon. The soils were probably leached of carbonates and soluble salts to a great extent before translocation of silicate clay occurred, even though the content of bases is still high in all soils of the county.

Leaching of bases and translocation of silicate clay are among the most important processes in horizon differentiation in the soils of Phillips County.

Classification of the Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through the use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus through classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and used in managing farms, fields, and woodland; in developing rural areas; in engineering work; and in many other ways. They are placed in broad classes to facilitate study and comparison in larger areas, such as regions, countries, and continents.

Two systems of classifying soils above the series level have been used in the United States in recent years. The older system was adopted in 1938 (*10*) and revised later (*9*).

The system currently used was adopted by the National Cooperative Soil Survey in 1965. Because this system is under continual study, readers interested in its development should search the latest literature available (*8*, *14*).

The current system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are properties that are observable or measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. Placement of some series in the current system of classification, particularly in families, may change as more precise information becomes available. In table 12, the soil series of Phillips County are placed in some categories of the current system. Most of the classes of the current system are briefly defined in the following paragraphs.

ORDER: Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. The two exceptions, the Entisols and Histosols, occur in many different climates.

As shown in table 12, there are four soil orders in Phillips County: Entisols, Inceptisols, Mollisols, and Alfisols. Entisols are young mineral soils that do not have genetic horizons or have only the beginning of such horizons.

Inceptisols are mineral soils that generally occur on young, but not recent, land surfaces. Horizons have definitely started to form in these soils.

Mollisols are friable soils that have a mollic epipedon, a diagnostic horizon that is a thick, dark-colored layer at the surface. This layer is much like a surface layer that formed under grass. This horizon has moderate or strong structure, and it has base saturation of 50 percent or more. These soils are dominantly saturated with bivalent cations and have argillic or cambic horizons. Argillic and combic horizons are diagnostic horizons that form below the soil surface. An argillic horizon is one in which illuvial silicate clay has accumulated. This horizon is called a natric horizon if it contains an appreciable amount of exchangeable sodium and has prismatic or columnar structure. A cambic horizon is a layer in which changes have been sufficient to give rise to soil structure, liberate iron, form silicate clay minerals, obliterate most evidence of original rock structure, or some combination of these.

Alfisols are soils that have argillic or natric horizons with accumulated iron and aluminum. Alfisols have a base saturation of more than 35 percent.

SUBORDER: Each order is subdivided into suborders, primarily on the basis of those characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. Soil properties used to separate suborders

TABLE 12.—*Classification of soil series*

Series	Family	Subgroup	Order
Alligator	Very fine, montmorillonitic, acid, thermic	Vertic Haplaquepts	Inceptisols.
Amagon	Fine-silty, mixed, thermic	Typic Ochraqualfs	Alfisols.
Arkabutla	Fine-silty, mixed, acid, thermic	Aeric Fluvaquents	Entisols.
Beulah	Coarse-loamy, mixed, thermic	Typic Dystrochrepts	Inceptisols.
Bonn	Fine-silty, mixed, thermic	Glossic Natraqualfs	Alfisols.
Calhoun	Fine-silty, mixed, thermic	Typic Glossaqualfs	Alfisols.
Calloway	Fine-silty, mixed, thermic	Glossaquic Fragiudalfs	Alfisols.
Commerce	Fine-silty, mixed, nonacid, thermic	Aeric Fluvaquents	Entisols.
Convent	Coarse-silty, mixed, nonacid, thermic	Aeric Fluvaquents	Entisols.
Crevasse	Mixed, thermic	Typic Udipsamments	Entisols.
Dubbs	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols.
Dundee	Fine-silty, mixed, thermic	Aeric Ochraqualfs	Alfisols.
Falaya	Coarse-silty, mixed, thermic	Aeric Ochraqualfs	Alfisols.
Foley	Fine-silty, mixed, thermic	Albic Glossic Natraqualfs	Alfisols.
Grenada	Fine-silty, mixed, thermic	Glossic Fragiudalfs	Alfisols.
Henry	Coarse-silty, mixed, thermic	Typic Fragiaqualfs	Alfisols.
Jeanerette [1]	Fine-silty, mixed, thermic	Typic Argiaquolls	Mollisols.
Lagrange	Coarse-loamy, mixed, thermic	Typic Ochraqualfs	Alfisols.
Loring	Fine-silty, mixed, thermic	Typic Fragiudalfs	Alfisols.
Marvell	Coarse-loamy, mixed, thermic	Typic Hapludalfs	Alfisols.
Memphis	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols.
Mhoon	Fine-silty, mixed, nonacid, thermic	Typic Fluvaquents	Entisols.
Natchez	Coarse-silty, mixed, thermic	Typic Eutrochrepts	Inceptisols.
Newellton	Clayey over loamy, montmorillonitic, nonacid, thermic	Aeric Fluvaquents	Entisols.
Robinsonville	Coarse-loamy, mixed, nonacid, thermic	Typic Udifluvents	Entisols.
Sharkey	Very fine, montmorillonitic, nonacid, thermic	Vertic Haplaquepts	Inceptisols.
Tunica	Clayey over loamy, montmorillonitic, nonacid, thermic	Vertic Haplaquepts	Inceptisols.
Zachary	Fine-silty, mixed, thermic	Typic Albaqualfs	Alfisols.

[1] About 60 percent of the Jeanerette soils in the survey area are taxadjuncts to the series because they have colors one-half to one unit of value lighter in the A horizon and the upper part of the B2t horizon.

mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation.

GREAT GROUP: Suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major horizons and features. The horizons used to make separations are those in which clay, iron, or humus has accumulated, or those that have restrictive layers that interfere with growth of roots or movement of water. The features used are the self-mulching properties of certain clays, soil temperature, major differences in chemical composition (mainly content of calcium, magnesium, sodium, and potassium), and the like. The great group is not shown separately in table 12 because it is the last word in the name of the subgroups.

SUBGROUP: Great groups are divided into subgroups, one representing the central (typic) segment of the group, and others, called intergrades, that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group.

FAMILY: Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

Mechanical and Chemical Analyses

Mechanical and chemical data resulting from laboratory analyses can be useful to the soil scientist in classifying soils. These data are helpful in estimating available water capacity, acidity, base-exchange capacity, mineralogical composition, organic-matter content, and other soil characteristics that affect management needs. The data are also helpful in developing concepts of soil formation. More recently, laboratory data have proved helpful in rating soils for nonfarm uses, that is, for residential, industrial, recreational, and transportational use.

Several factors are involved in selecting soils for laboratory analyses. Soils that are extensive and most important in the survey area are considered first. A review of available laboratory data is made to determine the need for additional information on these particular soils. Generally, priority is given to soils for which little or no laboratory data are available.

In Phillips County soils representing 18 soil series were selected for laboratory analyses. Profiles of these soils are described in the section "Descriptions of the Soils." The analyses were made by the University of Arkansas in Fayetteville. Table 13 shows the results.

Particle-size distribution was determined by the hydrometer method (*3*).

The bases were extracted with normal, neutral ammonium acetate. Magnesium was determined colorimetrically (*5*). The other bases were determined by flame photometry. The extractable acidity was determined by the barium chloride-triethanolamine method (*2*).

TABLE 13.—*Physical and*

[Analyses made by the University of Arkansas, Fayetteville, Ark. Dashed line indicates

Soil and sample number	Depth	Horizon [1]	Particle-size distribution: Very coarse sand through medium sand (2.0 to 0.25 mm.)	Fine sand (0.25 to 0.10 mm.)	Very fine sand (0.10 to 0.05 mm.)	Total sand (2.0 to 0.05 mm.)	Silt (0.05 to 0.002 mm.)	Clay (less than 0.002 mm.)
	Inches		*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Bonn silt loam: S-70-Ark-54-13.	0-2	Ap1	----------	2	3	5	89	6
	2-7	Ap2	----------	3	3	6	79	15
	7-17	Btg&A2	----------	2	3	5	78	17
	17-23	B22tg	----------	2	3	5	70	25
	23-35	B23tg	----------	2	3	5	71	24
	35-51	B24tg	----------	2	3	5	70	25
	51-69	C1g	1	2	2	5	75	20
	69-81	C2g	2	5	6	13	71	16
Calhoun silt loam: S-70-Ark-54-7.	0-5	Ap	1	3	5	9	84	7
	5-17	A2g	1	----------	1	2	80	18
	17-27	B21tg	----------	----------	1	1	71	28
	27-40	B22tg	1	----------	1	2	72	26
	40-52	B3g	1	----------	1	2	75	23
	52-67	C1g	----------	1	1	2	79	19
Calloway silt loam: S-70-Ark-54-23.	0-4	Ap1	2	1	1	4	83	13
	4-7	Ap2	1	1	1	3	85	12
	7-19	B2	1	----------	1	2	76	22
	19-27	A′2	1	----------	1	2	85	13
	27-33	B′x1	----------	----------	1	1	75	24
	33-43	B′x2(1)	----------	----------	1	1	77	22
	43-54	B′x2(2)	----------	----------	1	1	81	18
	54-72	B3	----------	----------	1	1	79	20
Convent silt loam: S-70-Ark-54-9.	0-7	Ap	----------	1	2	3	92	5
	7-21	C1	----------	----------	2	2	93	5
	21-29	C2(1)	----------	----------	2	2	91	7
	29-41	C2(2)	----------	----------	2	2	90	8
	41-56	C3	----------	----------	2	2	90	8
	56-65	C4g	----------	----------	1	1	80	19
Crevasse fine sand: S-70-Ark-54-11.	0-8	Ap	1	68	18	87	10	3
	8-17	C1	----------	57	32	89	6	5
	17-34	C2(1)	----------	75	16	91	8	1
	34-51	C2(2)	----------	57	33	90	8	2
	51-64	C3	----------	29	44	73	23	4
Dundee silt loam: S-68-Ark-54-8.	0-7	Ap	1	1	15	17	66	17
	7-11	B21tg	----------	1	14	15	58	27
	11-19	B22tg	----------	1	16	17	56	27
	19-30	B23tg	----------	----------	20	20	59	21
	30-48	B3g	1	----------	12	13	70	17
	48-56	C1g	----------	----------	7	7	76	17
Falaya silt loam: S-70-Ark-54-5.	0-8	Ap	----------	1	1	2	85	13
	8-17	A12	----------	----------	1	1	85	14
	17-30	A21g	----------	----------	1	1	84	15
	30-44	A22g	----------	----------	1	1	83	16
	44-61	B21tg	----------	----------	1	1	78	21

See footnote at end of table.

chemical analyses of selected soils

that analysis was not made or data resulting from the analysis were insignificant]

Extractable bases (milliequivalents per 100 grams of soil)				Extractable acidity	Base saturation	Reaction (1:1 soil-water)	Organic matter	Available phosphorus
Calcium	Magnesium	Sodium	Potassium					
				Meq./100g.	*Percent*	*pH*	*Percent*	*Parts per million*
1.7	1.3	0.2	0.3	8.9	28	4.8	3.5	31
1.0	2.1	.4	.2	3.9	49	5.7	1.5	5
.7	4.6	1.7	.1	5.0	59	7.2	.6	11
.4	6.8	6.5	.2	.7	95	8.2	.2	32
.4	6.5	6.5	.2	.3	98	8.1	.2	32
.5	7.1	8.1	.3	.8	95	8.4	.1	53
1.4	6.7	5.2	.3	.6	96	9.1	.1	48
3.4	7.3	4.2	.2	.3	98	9.0	.1	23
3.5	1.2	.2	.2	2.8	65	6.1	.8	33
3.6	1.8	.2	.1	8.1	41	5.1	.3	13
5.6	4.7	.4	.2	9.1	55	4.9	.3	8
5.9	4.6	.5	.1	6.9	62	5.2	.2	20
7.6	5.2	.4	.2	5.1	72	5.5	.2	35
6.5	4.6	.4	.2	5.5	68	5.6	.2	32
3.7	.8	.2	.2	6.7	42	5.5	1.4	29
4.0	.8	.2	.2	6.9	43	5.6	1.7	36
1.8	.8	.3	.1	11.5	21	4.9	.5	14
1.2	1.1	.5	.1	7.5	28	5.3	.2	7
2.0	3.0	1.3	.3	12.6	34	5.5	.2	8
2.5	3.8	2.0	.2	11.1	43	5.4	.2	12
3.1	4.2	2.5	.2	7.5	57	5.5	.2	16
3.6	4.3	3.2	.2	4.3	72	6.7	.2	18
6.7	1.3	.2	.3	1.8	83	7.1	2.1	58
5.1	.7	.1	.1	.7	90	7.9	.8	8
3.6	1.6	.2	.1	1.0	85	7.8	.4	11
3.5	1.7	.2	.1	1.2	82	7.8	.3	17
3.8	1.9	.2	.1	.7	90	7.7	.3	19
6.6	3.8	.2	.2	3.2	77	7.1	1.1	55
2.9	1.5	.2	.2	1.5	76	6.1	1.1	28
3.0	1.5	.2	.2	.6	89	7.5	.3	24
3.0	1.3	.2	.2	.7	87	7.7	.3	10
3.6	1.2	.2	.1	.8	86	7.8	.2	8
4.5	1.4	.2	.1	.6	91	7.8	.3	9
6.1	1.9	.2	.4	4.9	64	5.9	1.1	40
7.4	2.5	.3	.3	11.5	48	4 6	.5	57
6.5	3.0	.3	.3	13.2	43	4.5	.4	61
5.0	2.9	.4	.3	10.6	45	4.7	.4	61
5.6	3.3	.7	.3	7.8	56	5.1	.3	49
7.9	3.8	.3	.2	8.1	60	5.5	.2	33
3.9	1.9	.2	.2	4.7	57	5.5	.8	26
4.1	1.9	.2	.1	5.8	52	5.5	1.2	31
2.7	1.2	.2	.1	7.3	37	5.0	.7	52
3.8	3.0	.4	.1	5.6	57	5.5	.4	34
4.8	3.9	.4	.1	2.2	81	6.5	.3	24

TABLE 13.—*Physical and chemical*

Soil and sample number	Depth	Horizon [1]	Particle-size distribution: Very coarse sand through medium sand (2.0 to 0.25 mm.)	Fine sand (0.25 to 0.10 mm.)	Very fine sand (0.10 to 0.05 mm.)	Total sand (2.0 to 0.05 mm.)	Silt (0.05 to 0.002 mm.)	Clay (less than 0.002 mm.)
	Inches		*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Foley silt loam: S-61-Ark-54-1.	0-3	Ap1	----------	1	1	2	85	13
	3-8	Ap2	----------	1	1	2	83	15
	8-12	A2g	----------	----------	1	1	86	13
	12-16	B21tg(1)	----------	----------	----------	----------	75	25
	16-19	B21tg(2)	----------	----------	----------	----------	71	29
	19-24	B22tg	----------	----------	----------	----------	70	30
	24-29	B23tg	----------	----------	----------	----------	70	30
	29-35	B24tg	----------	----------	----------	----------	68	32
	35-39	B25tg(1)	----------	----------	1	1	66	33
	39-43	B25tg(2)	----------	----------	1	1	66	33
	43-47	B25tg(3)	----------	----------	1	1	66	33
	47-51	B25tg(4)	----------	----------	1	1	66	33
	51-55	B25tg(5)	----------	1	1	2	67	31
	55-60	B25tg(6)	----------	1	1	2	67	31
Grenada silt loam: S-68-Ark-54-5.	0-7	Ap	----------	1	2	3	89	8
	7-19	B21	----------	----------	1	1	77	22
	19-24	B22	----------	----------	1	1	75	24
	24-28	A'2	1	----------	1	2	82	16
	28-34	B'x1	1	1	1	3	73	24
	34-45	B'x2	----------	----------	1	1	77	22
	45-59	B'x3	----------	----------	1	1	78	21
	59-72	Cx	----------	----------	1	1	84	15
Henry silt loam: S-70-Ark-54-17.	0-5	Ap	----------	----------	1	1	86	13
	5-19	A21g	----------	1	1	2	81	17
	19-25	A22g	----------	----------	1	1	81	18
	25-33	Bx1	----------	----------	1	1	67	32
	33-49	Bx2	----------	1	1	2	69	29
	49-60	B3g	----------	----------	1	1	77	22
Jeanerette silt loam: S-70-Ark-54-4.	0-4	Ap	1	1	1	3	81	16
	4-16	A12	2	2	1	5	72	23
	16-28	B2ltg	----------	----------	1	1	73	26
	28-43	B22tg	3	1	1	5	72	23
	43-60	B3g	1	----------	1	2	80	18
Lagrange fine sandy loam: S-70-Ark-54-8.	0-6	Ap	19	35	15	69	26	5
	6-12	B11g(1)	20	33	14	67	28	5
	12-25	B11g(2)	24	30	10	64	27	9
	25-33	B12g	29	38	17	84	11	5
	33-47	IIB21tg	7	7	3	17	71	12
	47-64	IIB22tg	2	1	1	4	73	23
Loring silt loam: S-70-Ark-54-25.	0-5	Ap	----------	----------	1	1	84	15
	5-9	B1	----------	----------	1	1	84	15
	9-26	B2t	----------	----------	1	1	74	25
	26-32	Bx1	----------	----------	1	1	80	19
	32-41	Bx2	----------	----------	1	1	80	19
	41-52	Bx3	----------	----------	1	1	75	24
	52-62	C (1)	----------	----------	1	1	77	22
	62-72	C (2)	----------	----------	1	1	81	18

See footnote at end of table.

analyses of selected soils—Continued

Extractable bases (milliequivalents per 100 grams of soil)				Extractable acidity	Base saturation	Reaction (1:1 soil-water)	Organic matter	Available phosphorus
Calcium	Magnesium	Sodium	Potassium					
				Meq./100g.	*Percent*	*pH*	*Percent*	*Parts per million*
2.3	2.1	.1	.4	6.7	42	5.7	.7	33
2.0	2.1	.4	.2	9.7	33	5.6	.9	22
.8	3.1	.4	.1	7.5	37	5.4	.9	13
.6	5.2	1.3	.1	11.4	39	5.3	.9	21
.8	7.3	1.6	.1	11.6	46	5.1	1.0	25
.9	8.3	3.4	.2	9.2	58	5.0	.8	29
1.1	9.4	4.9	.2	5.3	75	5.0	.5	45
.2	14.6	7.6	.2	2.9	89	7.9	.3	58
.3	14.6	9.2	.3	2.2	92	7.8	-----------	96
.3	16.7	8.8	.3	1.8	94	7.8	-----------	132
.3	16.7	9.1	.3	2.6	91	7.9	-----------	154
.3	18.8	10.0	.3	3.4	90	8.1	-----------	164
1.9	18.8	9.5	.3	4.3	88	8.0	.1	164
1.9	16.7	8.4	.3	5.5	83	8.1	.2	140
2.7	1.4	.2	.2	3.8	54	6.1	1.1	17
3.0	2.1	.2	.2	8.6	39	5.1	.5	21
2.1	2.1	.3	.2	12.3	28	4.9	.3	18
2.1	2.2	.3	.1	8.5	36	5.0	.3	9
4.1	4.6	.4	.2	8.3	53	5.1	.4	6
5.6	5.6	.4	.2	5.3	69	5.7	.3	9
6.2	5.7	.4	.2	3.7	77	6.6	.5	17
5.5	4.7	.3	.2	4.0	73	7.1	.2	17
3.2	1.1	.1	.2	7.2	39	5.2	1.3	33
3.5	1.4	.2	.1	7.3	42	5.2	.5	28
3.1	2.0	.2	.2	8.5	39	5.1	.3	26
4.1	3.7	.4	.2	11.1	43	4.8	.3	32
6.6	6.6	.5	.2	9.3	60	4.8	.3	31
6.0	6.0	.5	.2	3.4	79	5.5	.1	26
6.8	2.3	.2	.4	5.8	63	5.9	2.4	61
10.5	3.9	.3	.1	3.7	80	6.4	2.1	5
11.2	5.5	.4	.1	1.8	96	7.5	.7	2
16.6	6.4	.4	.1	.4	98	8.0	.4	2
9.9	5.4	.3	.1	1.5	91	8.0	.3	2
1.2	.4	.2	.2	2.2	48	4.8	.6	29
1.2	.5	.2	.2	2.5	46	4.9	.8	33
2.2	.6	.1	.1	3.7	45	5.2	.3	20
1.3	.6	.2	.1	1.7	56	4.9	.2	26
1.7	1.7	.2	.1	6.7	36	4.9	.2	9
4.3	3.9	.4	.2	8.5	51	5.2	.2	12
2.8	1.1	.1	.3	5.1	46	5.1	1.0	37
2.4	.9	.2	.1	5.4	40	4.9	.9	27
2.8	1.7	.2	.2	12.0	29	5.0	.3	39
2.1	1.4	.3	.2	10.5	28	5.0	.2	38
2.1	1.6	.3	.2	9.1	32	5.3	.2	26
2.9	2.1	.4	.2	11.9	32	5.2	.2	15
3.1	3.0	.3	.2	11.0	38	5.1	.2	15
3.4	2.2	.3	.2	8.7	41	5.4	.1	17

TABLE 13.—*Physical and chemical*

Soil and sample number	Depth	Horizon [1]	Particle-size distribution: Very coarse sand through medium sand (2.0 to 0.25 mm.)	Fine sand (0.25 to 0.10 mm.)	Very fine sand (0.10 to 0.05 mm.)	Total sand (2.0 to 0.05 mm.)	Silt (0.05 to 0.002 mm.)	Clay (less than 0.002 mm.)
	Inches		*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Marvell fine sandy loam: S-67-Ark-54-1.	0-6	Ap	7	45	17	69	28	3
	6-15	A12	7	44	24	75	22	3
	15-23	B11	7	34	19	60	29	11
	23-36	B12	6	26	22	54	38	8
	36-53	IIB21t	2	4	5	11	74	15
	53-65	IIB22tg	1	1	2	4	77	19
Natchez silt loam: S-69-Ark-54-2.	0-4	A11	----	----	1	1	87	12
	4-11	A12	----	----	2	2	82	16
	11-19	B1	----	----	2	2	79	19
	19-33	B2	----	----	2	2	83	15
	33-72	C	----	----	2	2	93	5
Newellton silty clay: S-70-Ark-54-20.	0-4	Ap	----	----	2	2	54	44
	4-15	B	----	----	1	1	56	43
	15-22	IIC1	----	8	28	36	49	15
	22-39	IIIC2	----	4	47	51	42	7
	39-56	IVC3(1)	----	41	44	85	13	2
	56-72	IVC3(2)	----	37	46	83	15	2
Sharkey silty clay: S-70-Ark-54-3.	0-5	Ap	----	----	1	1	59	40
	5-19	B21g	----	----	1	1	42	57
	19-31	B22g	----	----	1	1	31	68
	31-46	B3g	----	----	1	1	28	71
	46-58	C1g	----	----	1	1	30	69
	58-65	C2g	----	----	1	1	32	67
Tunica silty clay: S-70-Ark-54-19.	0-5	Ap	----	----	2	2	57	41
	5-10	B21g	----	----	1	1	57	42
	10-27	B22g	----	2	2	4	47	49
	27-36	IIC1	16	43	13	72	21	7
	36-55	IIC2g	9	14	25	48	44	8
	55-72	IIIC3	30	37	19	86	13	1

[1] Numbers in parentheses indicate the horizon was subdivided for sampling and analysis.

analyses of selected soils—Continued

Extractable bases (milliequivalents per 100 grams of soil)				Extractable acidity	Base saturation	Reaction (1:1 soil-water)	Organic matter	Available phosphorus
Calcium	Magnesium	Sodium	Potassium					
				Meq./100g.	*Percent*	*pH*	*Percent*	*Parts per million*
1.6	.3	.2	.2	2.4	49	5.7	.6	50
2.2	.6	.2	.2	2.7	54	5.9	.4	41
3.2	.9	.2	.2	3.2	58	5.7	.4	50
2.6	.7	.3	.9	3.9	54	5.9	.3	47
4.1	2.2	.3	.2	6.3	52	5.8	.3	38
4.2	3.3	.2	.3	7.5	52	5.6	.3	23
8.1	3.4	.2	.4	2.8	81	7.2	3.3	23
8.3	2.7	.2	.1	1.9	86	7.8	1.3	15
7.9	3.3	.1	.1	1.3	90	7.9	.5	18
7.0	4.0	.2	.2	1.5	88	7.6	.4	11
6.2	3.6	.2	.1	2.4	81	8.0	.3	10
17.2	6.1	.2	.8	6.4	79	6.6	2.6	30
15.8	5.2	.2	.5	6.3	78	7.0	1.9	8
5.9	3.0	.1	.2	1.5	86	7.7	.7	9
4.4	2.3	.2	.1	.5	93	7.9	.5	9
3.8	1.1	.2	.1	.2	96	8.1	.1	9
4.3	1.1	.2	.1	.1	98	8.1	.1	10
19.5	5.3	.2	.8	5.2	83	6.7	3.5	40
20.4	6.8	.2	.7	7.2	80	6.9	2.6	22
24.5	8.6	.4	.8	6.3	84	7.0	1.8	14
30.5	12.3	1.0	.9	3.9	92	7.2	1.1	16
29.7	12.5	1.2	.9	2.3	95	7.4	1.1	12
28.4	13.0	1.1	.9	3.2	93	7.4	1.1	12
15.5	5.5	.2	.4	4.9	82	6.8	1.8	23
17.5	6.2	.2	.5	4.3	85	6.9	2.2	22
18.5	7.1	.2	.4	6.5	80	6.8	1.6	27
4.9	1.5	.2	.1	1.5	82	7.0	.4	28
5.0	1.5	.2	.1	1.4	83	7.3	.2	22
2.6	.8	.1	.1	.4	90	7.2	.1	12

The total of extractable calcium, potassium, magnesium, sodium, and extractable acidity is an approximation of the cation exchange capacity of the soil. Base saturation percent was determined by dividing this total into the sum of calcium, potassium, magnesium, and sodium and multiplying by 100.

Soil pH was determined using a Beckman pH meter on mixtures of soil and water at a 1:1 ratio. Available phosphorus was extracted by the Bray No. 1 solution (0.03 normal ammonium flouride in 0.025 normal hydrochloric acid) and determined colorimetrically.

Organic carbon was determined by the Walkley-Black method of digestion with potassium dichromate-sulfuric acid (*5*). Percentage of organic matter was then calculated by multiplying the percentage of organic carbon by 1.72.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Bedding planes. Horizontal contact planes or faces between strata that were mainly deposited by water.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Eluviation. The movement of material from one place to another within the soil, in either true solution or colloidal suspension. Soil horizons that have lost material through eluviation are said to be eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has been allowed to drain away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

Illuviation. The accumulation of material in a soil horizon through the deposition of suspended material and organic matter removed from horizons above. Since part of the fine clay in the B horizon (or subsoil) of many soils has moved into the B horizon from the A horizon above, the B horizon is called an illuvial horizon.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to relatively level plots surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops, or in orchards, to confine the flow of water to one direction.

Furrow.—Water is applied in small ditches made by cultivation implements used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Irrigation water, released at high points, flows onto the field without controlled distribution.

Levee. Low ridge build up by a stream on its flood plain that acts to confine the stream during flooding. Natural levees change location on the flood plain under the stream's influence.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state. In engineering, a high liquid limit indicates that the soil has a high content of clay and a low capacity for supporting loads.

Loess. Fine-grained material, dominantly of silt-sized particles, that has been deposited by wind.

Loam. Textural class of soil containing 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical mineralogical, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

pH value. A numerical means for designating acidity and alkalinity in soils. A pH value of 7.0 indicates precise neutrality; a higher value, alkalinity; and a lower value, acidity.

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Site index. A numerical means of expressing the quality of a forest site that is based on the height of the dominant stand at an arbitrarily chosen age; for example, the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on relatively steep slopes and in swelling clays, where there is marked change in moisture content.

Slope. The rate of rise of the surface of the soil, expressed as a percent. The percentage is the number of feet rise per hundred feet vertical distance. The slope classes used in this survey are:

	Percent		*Percent*
Level	0 to 1	Moderately sloping	8 to 12
Nearly level	1 to 3	Moderately steep	12 to 20
Gently undulating	0 to 3	Steep	20 to 40
Gently sloping	3 to 8		

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles, less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *Very coarse sand* (2.0 to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter). The separates recognized by the International Society of Soil Science are as follows: I (2.0 to 0.2 millimeter); II (0.2 to 0.02 millimeter); III (0.02 to 0.002 millimeter); IV (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Strata. Layers in a soil inherited from the parent material. Layers that result from the processes of soil formation are called horizons.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Subsurface layer. A horizon immediately below the surface layer. Usually an A2 or Ap2 horizon.

Surface layer. A term used in nontechnical soil description for one or more layers above the subsoil. Includes the A horizon and part of the B horizon; has no depth limit.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which plants (specifically sunflower) wilt so much that they do not recover when placed in a dark, humid atmosphere.

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GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the description of the soil series to which the mapping unit belongs. In referring to a capability unit or woodland group, read the introduction to the section it is in for general information about its management. Other information is given in tables as follows:

Acreage and extent, table 4, page 10.
Predicted yields, table 5, page 36.
Suitability of soils for wildlife habitat, table 6, page 38.
Engineering uses of the soils, tables 8, 9, and 10, pages 44 through 58.
Degree and kinds of limitations for building sites, table 11, page 60.

Map symbol	Mapping unit	Described on page	Capability unit Symbol	Woodland group Symbol
Ac	Alligator clay	10	IIIw-1	2w6
Ag	Alligator soils, frequently flooded	10	IVw-1	3w6
Am	Amagon silt loam	11	IIIw-2	1w6
Ar	Arkabutla silty clay loam	12	IIw-1	1w5
As	Arkabutla soils, frequently flooded	12	IVw-2	1w6
BeU	Beulah fine sandy loam, gently undulating	13	IIs-1	2o4
Bo	Bonn silt loam	14	IVs-1	5t0
Ca	Calhoun silt loam	15	IIIw-3	3w9
CbA	Calloway silt loam, 0 to 1 percent slopes	15	IIw-2	3w8
CbB	Calloway silt loam, 1 to 3 percent slopes	15	IIe-2	3w8
Cm	Commerce silt loam	16	IIw-1	1w5
Cn	Commerce soils, frequently flooded	16	IVw-3	1w5
Co	Convent silt loam	17	IIw-1	1w5
Cr	Crevasse soils, frequently flooded	17	IVw-4	3s6
DsU	Dubbs silt loam, gently undulating	18	IIe-1	2o4
Du	Dundee silt loam	19	IIw-1	2w5
Fa	Falaya silt loam	20	IIw-1	1w8
Ff	Fluvaquents, frequently flooded	21	------	-----
Fo	Foley silt loam	21	IIIw-4	3w9
GrB	Grenada silt loam, 1 to 3 percent slopes	22	IIe-2	3o7
He	Henry silt loam	23	IIIw-3	3w9
Je	Jeanerette silt loam	23	IIw-1	2w6
La	Lagrange fine sandy loam	24	IIIw-2	2w9
LoB	Loring silt loam, 1 to 3 percent slopes	25	IIe-2	3o7
LoC2	Loring silt loam, 3 to 8 percent slopes, eroded	25	IIIe-1	3o7
Ma	Marvell fine sandy loam	26	I-1	2o4
MeB	Memphis silt loam, 1 to 3 percent slopes	26	IIe-2	2o7
MeC2	Memphis silt loam, 3 to 8 percent slopes, eroded	26	IIIe-1	2o7
MeD2	Memphis silt loam, 8 to 12 percent slopes, eroded	27	IVe-1	2o7
MeE	Memphis silt loam, 12 to 40 percent slopes	27	VIIe-1	2r8
Mh	Mhoon soils, frequently flooded	27	IVw-2	1w6
NaE	Natchez silt loam, 20 to 40 percent slopes	28	VIIe-1	2r8
Ne	Newellton silty clay	29	IIw-3	2w5
NeU	Newellton silty clay, gently undulating	29	IIIw-1	2w5
Nf	Newellton soils, frequently flooded	29	IVw-1	3w6
Ro	Robinsonville fine sandy loam	30	I-1	1o4
Rs	Robinsonville soils, frequently flooded	30	IVw-3	1o4
Sh	Sharkey silty clay	31	IIIw-1	2w6
Sk	Sharkey soils, frequently flooded	31	IVw-1	3w6
Tn	Tunica silty clay	32	IIIw-1	2w6
TnU	Tunica silty clay, gently undulating	32	IIIw-1	2w6
Tu	Tunica soils, frequently flooded	32	IVw-1	3w6
Za	Zachary soils, frequently flooded	33	IVw-2	2w6